



TRANSACTIONS  
OF THE  
CARLISLE  
NATURAL HISTORY SOCIETY.

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VOL. I.

1909.

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1870-1871

THE PRESIDENT

OF THE UNIVERSITY OF CHICAGO

CHICAGO, ILL.

DEAR SIR,

I have the honor to acknowledge the receipt of your letter of the 10th inst.

and in reply to inform you that the same has been forwarded to the proper authorities.

Very respectfully,

JOHN D. COVILLE

Curator of the Museum

CHAS. HILL NATURAL HISTORY MUSEUM

CHICAGO, ILL.

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## INTRODUCTION.

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IN presenting the first volume of Transactions of the Carlisle Natural History Society, a brief historical sketch may be of interest to the reader.

Rather over fifteen years ago, some five or six young residents of Carlisle, enthusiastic collectors of butterflies and moths, thought that by forming themselves into a "society" or "field club," much mutual advantage would result, and accordingly the Carlisle Entomological Society was formed. Meetings were held for some time at one or the other of the homes of the few members. These meetings were social rather than formal, and though pleasant enough in themselves, the young society soon began to languish for want of a regular place of meeting. This threatened end was happily averted by the late Rev. H. A. Macpherson, who, hearing of the efforts of the young lepidopterists, invited them to meet him and discuss the position.

Though not himself an entomologist, Mr. Macpherson's wide interests in Zoology made him a ready sympathiser with the efforts of students of other branches of natural history. As a result of the conference it was decided to widen the scope of the society, admitting students of other branches of Zoology and of Botany, and changing the name to "The Carlisle Entomological and Natural History Society." Mr. Macpherson was elected President, and with an increase in membership and added vitality, the home of the society was transferred from his house to the Museum at Tullie House, where every facility was given for holding comfortable meetings, a circumstance which still obtains.

Under the Presidency of Mr. Macpherson, it was but natural that Ornithology should become a leading interest among the members, and records and observations on the bird-life of the district formed a feature of the meetings. The lepidopterists,

however, were not idle, and supported their notes and records by exhibiting extensive series of their captures, and took up the study of other Orders of insects.

The work of a Natural History Society must perforce be concentrated upon the district in which it is located, and hitherto the researches of the society have been confined to Cumberland, with occasional papers on the Fauna of Westmorland.

During the earlier years of its life, the society held its meetings throughout the year. Later, however, the summer meetings were abandoned. It became the rule to arrange a series of outings into various parts of the district, usually into some locality unfamiliar to most of the members, with a view to ascertaining the birds, insects, plants, etc., to be found there. In this way much has been added to the knowledge of the distribution of life in Cumberland, and not a few species of insects have been added to the local lists.

Several of the leading members are specialists in their branches of study, and are engaged upon the compilation of county lists. Some of these are commenced in the present publication, and it is hoped will be completed in subsequent volumes, when other subjects will be taken up. These Transactions are in fact, intended to be a medium of publication for all that is of interest concerning the Natural History of Cumberland and Westmorland.

# A BYEGONE CUMBERLAND NATURALIST

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A MEMOIR OF T. C. HEYSHAM.

BY JAMES MURRAY.

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To students of local Natural History, the name of Heysham has no unfamiliar sound, and I think it almost impossible to find a work of any importance in any department of local Natural History, without this name occurring with more or less frequency. The late Rev. H. A. Macpherson, when he published his "Birds of Cumberland," in 1886, dedicated it to

JOHN HEYSHAM, M.D.,

and

THOMAS COULTHARD HEYSHAM,

both eminent Naturalists.

A great deal of confusion seems to exist in the minds of local naturalists and others, as to the work and individuality of these two. As a case in point, Miller Christy, in his notice of the late Henry Doubleday in his "Birds of Essex," confuses the younger with the elder Heysham, and attributes the intimate personal friendship which existed between Doubleday and Heysham to the old Doctor. I have thought it best, therefore, to introduce a few remarks on Dr. John Heysham's life and scientific work.

Dr. Heysham, the elder, was born at Lancaster, in November, 1753, and came to Carlisle in 1778, to follow his profession of surgeon. He soon manifested much interest in the little city (Carlisle then contained something like six thousand inhabitants), helping, among other things, to establish a Public Subscription Library, and the Carlisle Dispensary. In 1808 he was made a Magistrate. In 1789 he married Miss Coulthard, and Macpherson seems to think he did little field work after this date, although

he continued to manifest a lively interest in all living things. His son, writing to Sir William Jardine in 1836, said : " Dr. Heysham, I believe, never published any paper of any consequence on Natural History, except his Catalogue of Cumberland Animals, having, soon after its appearance, turned his attention to other pursuits, although he still continued to take a very great interest in all matters connected with the subject until within a very short period of his death." He commenced his ornithological studies soon after his arrival in Carlisle, because in 1781 he killed a female Peregrine Falcon at Gilsland, after waiting five hours for a shot. In 1801, he noted a Turnstone, shot on Ullswater. He possessed a considerable collection of birds' skins, having specimens of most of the species named in his catalogue. He also devoted much time to studying the development of the salmon. He died on March 23rd, 1834, aged 80 years, leaving one son, the subject of this paper.

Thomas Coulthard Heysham was born in Carlisle in 1792, and devoted the greater part of his life to the close study of nature in most of its various branches, being an accomplished Ornithologist, Conchologist, Entomologist, and Botanist. Of his early years we know very little, but as Ornithology was his chief and most enduring study, and the one on which his earliest notes and papers treated, I think we may safely infer that much of his boyhood would be spent in rambles after birds and their nests in the vicinity of his native city. Carlisle was much more circumscribed in area in Heysham's youth than now, containing some 23,000 inhabitants in 1841, yet spoken of by him at that time as a populous district.

When we consider the great disadvantages under which he laboured, compared with those we now enjoy, we cannot but be filled with admiration for the amount of work he actually accomplished. His axiom (felt, but not expressed), seems to have been : " If a thing is worth doing at all, it is worth doing well." Railways and the Penny Post only came into active existence during the last years of his life. Most of his travelling had to be done on foot, and Heysham was a great pedestrian. During his earlier years he thought very little of walking from Carlisle to Keswick and back in a day, and many of his rambles seem to have been along the beautiful valleys of the Caldew and Petteril.

In 1842 Edward Newman requested him to furnish a tabulated list, with dates of arrival of summer migrants, for publication in the Zoologist, then just commencing. Heysham replied that a few years before he had paid great attention to this subject, and annually sent the results to the Editor of the "Philosophical Magazine and Annals," but since the death of Dr. Heysham, other engagements had obliged him to relinquish the pursuit. "The truth is," to use Heysham's own words, "it required considerable exertion to make out anything like an accurate list. From the latter end of March to the first week in May, I was constantly on my legs, often walking from thirty to forty miles a day, frequently without seeing the species I was looking after, so that I was obliged to go over the same ground twice."

The following table of bird arrivals is taken from Loudon's Magazine of Natural History for 1836, page 185, and which was supplied by Heysham under the *nom-de-plume* of "a correspondent."—

Quail, May 2.	Greater Pettychaps, May 10.
Swallow, April 3.	Wood Wren, May 6.
House Martin, April 13.	Blackcap, April 13.
Swift, May 2.	Whitethroat, May 6.
Goatsucker, May 4.	Yellow Wren, April 11.
Pied Flycatcher, April 29.	Yellow Wagtail, April 17.
Spotted Flycatcher, May 14.	Field Lark, or Titling, April
Ring Ousel, April 11.	22.
Wheatear, April 4.	Cuckoo, April 23.
Whinchat, May 5.	Wryneck, April 19.
Redstart, April 22.	Corncrake, April 19.
Grasshopper Warbler,	Dottrel, May 6.
April 13.	Common Tern, May 20.
Sedge Warbler, May 7.	

It is very probable that, as T. C. Heysham assisted his father in the management of his private affairs, the Doctor would seek to cultivate in his son a love for his own pursuits. The younger Heysham was a man of active habits, with ample leisure and means to gratify his scientific tastes, consequently he sought to add to his collection by purchasing such specimens as he required from dealers, or exchanging with other collectors. In 1842, Robert

Dunn, of Hull, wrote to Heysham, offering him two skins of the Great Auk for £7 10s. 0d. each, and in 1840, Mr. Procter offered him the egg of the same bird for £3. Unfortunately none of these were secured. Heysham had many other correspondents in all parts of the country, with whom, from time to time, he conducted exchanges, for one of the primary objects of the Naturalist in those days was the formation of a fine collection.

In the earlier decades of the last century, Carlisle was happy in possessing a numerous band of indefatigable working men naturalists, and with most of these Heysham was on more or less intimate terms. Poachers, perhaps, some of them were, but skilled nevertheless, in the ways of bird and beast. Whenever any of these found some rare or uncommon specimen of bird, insect, or plant, it was the custom to refer it to Tom Heysham. Be it remembered that in those days books on Natural History were rare and expensive, and the cost of sending even small parcels to any distance, prohibited these poor fellows from putting anything into their collections, save what they got by their own exertions. They were a sturdy crew, however, and thought little of tramping long distances, sleeping out in caves in the woods, and even on mountain sides, and walking home again next day. Among these may be mentioned James Cooper, the Reeves, and the elder Hodgkinson. These men found Heysham a ready purchaser for any rare bird they might come across. The first of these, Cooper, was a man of no common clay, and deserves more than passing mention here. He was a handloom weaver by trade, and in the thirties resided at Little Orton, where he collected moths on the common, and sent them to Heysham by his daughter. He next moved into Carlisle, and commenced business as a bird-stuffer at No. 3 Union Street. He removed from thence to Preston, where he worked in the mills, and shot and mounted birds during his leisure. He eventually became Curator of Warrington Museum.

One of Heysham's principal contributions to ornithological literature, was his paper on the Dotterel, which appeared in the "Magazine of Natural History" for 1838, and for much of the information contained therein, he was indebted to James Cooper, who was the "able assistant" mentioned. He it was who discovered the eggs of that bird on Whiteside. He was a man who

seemed capable of enduring any amount of fatigue. On the 28th of June, 1835, he walked from Carlisle to Whiteside, a distance of between thirty and forty miles, where he arrived late in the afternoon. He had not been long on the mountain before he observed a pair of Dotterel. He searched for the eggs without success till darkness came on, when he decided to stay out on the mountain all night, and renew his search at daybreak, which he did, and was rewarded by finding the eggs. He then walked back to Carlisle, never having been in bed since leaving there the previous day. Cooper was not, however, the discoverer of the eggs of this bird in Britain, as stated by Macpherson in the *Birds of Cumberland*, that honour belonging to Dr. Heysham, who got a clutch on Skiddaw in the summer of 1784, authenticated by one of the old birds being shot on the nest. A few days after Cooper's visit to Whiteside, Heysham accompanied him to Robinson (another Cumbrian mountain) where they obtained another clutch of two eggs, and a young bird. Heysham then sent the birds and eggs to Yarrell, who was delighted with them, and wrote of them as "perfect beauties." Besides occurring in the Lake Mountains, the Dotterel was proved, by means of Heysham's pertinacity, to occur and breed in the Pennines. He received an egg from B. Greenwell, of Alston, one of a clutch of three, found about two miles from the summit of Cross Fell.

Another bird, whose habits Heysham studied, was the Pied Flycatcher. He was well acquainted with the habitat of this species at Lowther, and has bequeathed us the interesting fact that it had only nested in the neighbourhood of Carlisle for five or six years prior to 1829. Among other rare birds occurring in the county, records of which Heysham has left us, may be mentioned the Fire Crest, White Wagtail, Waxwing, Crossbill, Two Barred Crossbill, Spotted Redshank, and Roseate Tern. Yarrell figured the Common Sandpiper in down, from a Cumberland specimen sent to him by Heysham. Heysham enjoyed the friendship of most of the leading British Ornithologists of his time, including Henry Doubleday, Hewitson, the Brothers Hancock, the Gurneys, and William Yarrell, with all of whom he was personally acquainted. He first met Yarrell in 1837, during one of his rare visits to London. Yarrell paid a return visit to Heysham in 1838, while passing through Carlisle, but

unfortunately Heysham was out, and was deeply grieved on returning home to find he had missed his friend. Yarrell also derived much valuable information from Heysham regarding the habits and local distribution of fishes, as can be seen on reference to Yarrell's well-known work on "British Fishes."

Heysham, though an excellent Ornithologist, was equally versed in Conchology, Entomology, and Botany. He had an intimate knowledge of the Land and Freshwater Shells of Cumberland, and at one time contemplated publishing a work on this subject, but the price asked by the publishers led him to abandon the idea. What became of the M.SS. is unknown. In 1841, he sent specimens of *Cyclas* (*Sphærium*) *lacustre* to a gentleman named Luke, at York, who was a good conchologist. Some correspondence seems to have passed between them as to the specific differences of *Unio tumidus* and *Unio ovalis*, and in one of his letters says, he "considers himself very impertinent to venture an *opposite* opinion," as he (Heysham) was so much better acquainted with the subject than he was. Another Conchologist in London, to whom Heysham sent local specimens of *Zonites excavatus*, *Limnea glabra*, *Bithynia tentaculata*, and *Anodonta cygnea*, wrote: "One would almost be inclined to think, by the beautiful gradations in growth in each series of specimens, that whole families had arranged themselves before you for the purpose of being captured, or rather, it shows they have been captured by a scientific naturalist."

In 1843, Heysham went to the Isle of Man for his health's sake, and devoted some time there to shell collecting, and sent to a Mr. J. Pickering the following species which he had found there:—

*Bulimus acutus.*

*Zonites umbilicatus.*

*Balea perversa.*

*Helix ericetorum.*

The *Helix ericetorum*, he remarks, are very different from any he had so far met with on the Cumberland coast.

That Heysham was a good botanist, there can be no doubt, but I do not think that he devoted the same attention to Botany that he did to Ornithology and Entomology. I find, on looking through Hodgson's "Flora of Cumberland," that his name only occurs seven times, but with the exception of *Viola odorata* and its var. *alba*, it is always in connection with some very rare plant. Perhaps the plant with which his name is most associated is the

Whorled Caraway (*Carum verticillatum*), the story of which is perhaps best told in Hodgson's own words : " Kingmoor, northward of Carlisle, reported from that station in 1882, by Mr. Wm. Duckworth, who flattered himself for a time with being the first recorder of that rarity. It has since transpired that the plant was gathered on Kingmoor in 1837 by the late T. C. Heysham, Esq., a former Mayor of Carlisle, and a keen naturalist." Another interesting plant which Heysham found was the Little Bladderwort (*Utricularia minor*), which it is supposed grew on Cardew Mire. He included among his botanical correspondents both the Hookers, who were then resident in Glasgow, and who frequently invited Heysham to visit them there. Heysham sent Hooker specimens of a moss, and Hooker replied : " Your moss is, as you suspect, *Trichostomum lanuginosum*, immensely common in mountainous situations. If you can take up the study of the mosses, I shall be happy to send you some rare ones." It will be seen from this that he did not confine his attention to the Phanerogams. Writing to James Cooper, in September, 1840, he says : " During the early part of the month, I made a short excursion to the Lakes in search of a few ferns, &c. The weather, as usual, proved unfavourable, and I did not get much. I, however, contrived to reach the summit of Skiddaw, and fell in with *Hymenophyllum Wilsoni*.

Heysham wrote to Stephen Calverley in June, 1846 : " The truth, however, is that I have done little or nothing in entomology for the last ten years." It seems difficult to reconcile this statement with the vast amount of correspondence on entomological subjects which passed between Heysham and the Rev. W. Little, of Raehills, Dumfriesshire ; Rudd ; John Walton ; Sam Stevens ; George Wailes, of Newcastle ; Sir W. Jardine ; the elder Dale ; and many others, during the period referred to. I suppose he was referring in this instance more particularly to Lepidoptera. Writing to John Walton in 1842, he stated that he had lost a good deal of time in the spring of that year looking for *Pissodes pini* in the fir plantations in the neighbourhood of Carlisle, but that he had not been successful. To the Rev. W. Little, in August, 1841, he wrote : " On Tuesday I went to the summit of Skiddaw for the express purpose of getting you another specimen of *Leistus montanus*, and although I remained there several hours,

and during the time turned over several hundreds of stones in various quarters, I could not meet with a single specimen ; indeed, I never observed so few insects since I have been in the habit of visiting this mountain." John Walton wrote to Heysham in 1841 : " I received with great pleasure your last letter, containing the *Rhynchites cupreus*, for which I feel particularly obliged. You certainly have been very fortunate in the capture of three of our rarest British insects, but I am aware they could not have been obtained without great and unwearied industry." It will be seen from this that Heysham was enthusiastically studying the local Coleoptera, although at the same time he was making excursions occasionally into Lakeland for such Lepidoptera as specially occur in those parts. He was quite familiar with *Erebia cassiope*, as he sent specimens of it to F. Bond, Rudd, Sam Stevens, and many other collectors, but whether he took *E. blandina* or not does not occur. He knew that it was plentiful at Raehills, near Beattock ; and Jardine Hall, near Lockerbie ; yet so far as is at present known, he has left no Cumberland record. That he hoped to find it, however, is evident, as a correspondent writing to him from the Alston district, in response to enquiries about a brown butterfly, said he knew it well, but at the time of writing (the end of June), it was too early for it. Heysham certainly sent many specimens of *E. blandina* to other collectors, but we must not infer from this that they were Cumbrian. Among other Lepidoptera taken by him in the Carlisle district, were *Plusia festucae* and *Epione vespertaria*. During his excursions into Borrowdale, he took, in addition to *E. cassiope*, *Emmelesia trigonata-adæquata*, *E. unifasciata*, *Larentia cæsiata*, and other sub-alpine species. Among the Lepidopterous records left us by Heysham for the Carlisle district, mention should be made of *Gnophria rubricollis*, from about Blackwell ; *Leucania impudens*, taken in the vicinity of Cardew Mire ; *Zonosoma orbicularia* and *Z. annulata*, the former from Heskett Moss, and the latter from Great Orton.

But Heysham was more than a lepidopterist and coleopterist, his researches extending to both the Hymenoptera and Diptera. In Fred. Smith's Catalogue of British Bees, several good species are recorded from Cumberland on the authority of Heysham, one of which, *Nomada roberjeotiana*, he found at Orton, where

it still occurs. Among the Diptera he took several interesting species, including *Nemoletus uliginosus*, which he found plentifully in some seasons on Burgh and Rockcliffe salt marshes; *Sargus infuscatus*, *S. formosus*, and *S. politus*, at Newby Cross and in the valley of the Petteril; *Sargus raumeri* he took on Rockcliffe marsh, and Curtis has given a beautiful figure of this fly in his "Illustrations of British Entomology," from a specimen sent him by Heysham from this locality. He also took a number of good Diptera on Cardew Mire, in those days a capital collecting ground for insects and plants. Between the years 1840-45, Heysham paid a good deal of attention to the Coleoptera of Cumberland, and particularly to the Rhynchophora or Weevils. He was encouraged in this by his friend and correspondent, John Walton, and during that period letters and specimens were continually passing between these two. Heysham met Walton first in the British Museum in December, 1840, and he had then about 150 species of Weevils, which he had picked up at various odd times—by no means a bad collection. Walton, like Heysham, was a man of means and leisure, which he devoted to a careful study of the Weevils of Europe, and he probably did more than any of his contemporaries to bring our nomenclature into line with that used on the Continent of Europe, being in correspondence with Gyllenhal, Schonherr, and other high authorities. Walton, in one of his letters to Heysham in 1841, gives a graphic account of his capture of the beautiful little *Apion limonii*. He says: "You will now be desirous of some account of my pedestrian expedition to the northern coast of Norfolk. I commenced at Lynn, and walked round to Cromer. At Holme-juxta-mere, situated in the north-eastern angle of the county, I found hundreds of acres of sea marsh land literally covered or dyed with the blossom of the *Statice limonium*, it is a beautiful lavender or lilac colour, and could be distinctly seen for miles,—what an enchanting sight to every lover of botany. There it has been in its wild native state, luxuriantly undisturbed by the hands of man, no doubt for generations, accompanied by its beautiful *Apion*. Millions may be taken; I was content to bring away 550 for the pleasure of giving them away." Frequently in his letters at this period, Heysham mentions suffering from grave indisposition, and in 1845 he visited London to consult a specialist, and from

## 10 A BYEGONE CUMBERLAND NATURALIST.

then he was frequently unable to leave his house for two or three months together. His latter days were passed in strict seclusion, his time, when health permitted, being passed in the examination of, and attention to his extensive collections. Undoubtedly he was a man much in advance of the time and place in which he lived, and his abilities were little understood or appreciated by his fellow citizens. He was courteous and generous with all his friends, and most painstaking and accurate in his observations, and has left behind him numerous records, which have since been found to be thoroughly reliable. One of his characteristics was his ever-ready help to all who cared to apply for it, either in the naming of specimens, or the loan of books. He had a very extensive library, containing many standard works, not only by British, but by French and German authors. He died at his own house, 45 Fisher Street, Carlisle, on April 6th, 1857, in his 65th year. His extensive collections and library were sold by auction in London, in May, 1859.

The following is his obituary notice from the "Carlisle Journal" of April 10th, 1857 :—

### DEATH OF T. C. HEYSHAM.

On Monday morning last, Mr. T. C. Heysham, of Fisher Street, in this City, was found dead in bed. Mr. Heysham had complained of slight indisposition for about six weeks previously, but his illness appeared to be of only a temporary nature, and no particular means were adopted to check its progress. His housekeeper enquired if he was desirous that a medical man should be sent for, but he said it was not necessary, as he thought he could do well enough himself. He was still able to walk about till Thursday, when he went to bed for a short time. On Friday he got up as usual, but on Saturday he did not feel so well. He continued in this state until Sunday night, when he retired to rest shortly before 10 o'clock—telling his housekeeper he would call her if he felt any worse. No alarm was given during the night, and on Monday morning, about 8 o'clock, the housekeeper went as usual to his room. He was lying in bed with his cheek on his right hand, but made no sign of recognition. She then discovered that he was dead. His feet and other parts of his body were still warm. The housekeeper called in a neighbouring servant to

her assistance, and a medical man was afterwards brought. On Tuesday an inquest was held on the body, before Mr. Lee, deputy coroner, and a respectable jury, with Mr. Huthart as chairman. Dr. Lonsdale and the housekeeper were examined, and the jury returned a verdict of "Died by the visitation of God from natural causes." Mr. Heysham had been subject to attacks of bilious fever, which hastened his death.

## FROM A CORRESPONDENT.

This week opened with the death of this distinguished naturalist, which took place at his house in Fisher Street, in this city. He was born in 1792, and devoted the whole of his life to scientific pursuits. From an early period nature was his study and delight. He has left behind him the labour of years, comprising a valuable collection of objects of Natural History, and although he never became an author, he contributed much valuable information on the *Grallatores*, or waders, and British birds generally, also on the growth of the salmon, and on the various transformations of insects. He possessed great powers of discrimination, and great accuracy. He was of persevering habits, and capable of enduring great fatigue, having been known to walk as far as Keswick, and return the same day, going over a distance of upwards of 60 miles.

Well acquainted with the oology of the district, he possessed one of the finest collections of the eggs of British Birds. On Skiddaw, in June, 1836, he found the nest of the Dotterel (*Charadrius morinellus*). On this occasion he observed a female bird of this species, and for seven long hours he kept his eyes upon it. At last he wearied the wary bird, and obtained the nest which contained the eggs. He assisted Yarrell in his "History of British Birds," and contributed materially to the work of that great naturalist. The splendid work published recently on birds by the Rev. F. O. Morris, contains many quotations, the produce of his pen. It is stated in this work, that he took the nest of the Pied Flycatcher (*Muscicapa luctuosa*) in Cumberland, which he beautifully describes, and which is one of our rarest summer visitants,

At Woodside, near Carlisle, a fine specimen of *Coccothraustus vulgaris* (Hawfinch), is recorded as having been seen by him, the only instance of this species having visited Cumberland. He possessed a fine collection of British Birds, and was an able botanist. Ornithology seems to have been his favourite study, but he possessed a sound knowledge of every department of Natural History, and no doubt he has left much valuable matter, which it is to be hoped, for the sake of the scientific world, will be published, that he may stand side by side with his contemporaries, Yarrell and Macgillivray. His collection consists also of *Lepidoptera* (Moths), *Coleoptera* (Beetles), *Hymenoptera* (Bees, Wasps, &c.) To the former he had of late paid little attention, and could not keep pace with the changes produced by the great work of Guenée. Of the latter order of insects he was complete master.

This brief notice the writer considers as a tribute that he owes to a brother naturalist. It may appear uninteresting here, but it will be recorded in another place, where his name will be honoured and respected.

Mr. Heysham was a bachelor, but was unlike Yarrell, his intimate friend, who was also a bachelor, but who could sing a good song, and was distinguished for his social qualities. With respect to his position as a naturalist, he was liberal in his exchange of specimens, and in no way distant in his manner. In the last few years of his life, his health gave way, and when the bright sun induced him to take the field, his day was setting in; he felt unwell, and had to shorten his journey. He never was more eager than during the last winter season, when the long severe weather was expected to force some rare visitants to our shores.

(Read March 5th, 1903.)

# WESTMORLAND ORNITHOLOGICAL NOTES, 1907.

By W. E. B. DUNLOP.

(*Read Jan. 6th, 1908.*)

In the following notes I have recorded the more interesting observations which have been made during the year 1907, in the County of Westmorland.

I must apologise for their scrappy nature, but the fact that for the most part I have been limited to week-ends for opportunities to study the bird-life of the county, has in many cases caused my notes to be very meagre.

For instance, much interesting information might have been gained concerning the nidification of the Peregrine Falcon, but on account of absence from home the eyrie could only be visited on two occasions.

The Year has altogether been an exceptionally bad one for the ornithologist, the cold, wet and stormy weather of the spring and summer months, making out-door work very unpleasant, and in some cases utterly impossible. Birds, like human beings, are seen at their best under sunny skies, and the continuously unfavourable climatic conditions added greatly to the difficulties of observing bird-life.

Young birds suffered greatly from the inclement weather, many broods being entirely destroyed. The Partridge is a case in point, their numbers having been greatly reduced in the district I am best acquainted with; the first broods were drowned by the floods at hatching time, and the later hatchings had no better fortune. In August I heard of young Partridges just out of the shell, but these late attempts to rear young failed also, the chicks being unable to withstand the early frosts.

Birds, as a general rule, laid fewer eggs than in a normal year, the strain put upon the constitution in resisting the unfavourable weather no doubt telling adversely on the egg-producing capabilities of the birds. For instance, the majority of Thrush's nests only contained four eggs, in very few instances did I see this number exceeded.

The fine spell of weather at Easter acted as a stimulus to nesting operations in some instances, but the subsequent cold weather retarded the majority, so that though there were some early broods the season taken as a whole was a late one.

A pleasing feature was the abundance of the Willow Wren and Whitethroat, which were both here in greater numbers than usual, though both are plentiful as a general rule.

Mr. Arthur Astley, of Elterwater, thinks that the Pied Flycatcher is increasing in the locality he has chiefly under observation. This is welcome news.

To this keen ornithologist my thanks are due for very generously placing his valuable notes at my disposal for the purpose of this paper.

Hard frost marked the opening days of 1907, the result of which was to bring wildfowl on to the Lakes in larger numbers than usual.

Tufted Duck were especially numerous, almost every sheet of water had some numbers of this species regularly frequenting it, indeed the abnormal numbers of *Fuligula cristata* was the most striking feature of bird-life during the earlier months of the year.

On January 4th an immature female Red-necked Grebe was shot on Windermere, the severe weather being doubtless responsible for its presence there.

The unfortunate was swimming and diving near the shore of the lake in company with four other birds, possibly of the same species.

January 8th.—A Greater Spotted Woodpecker was noted.

There can be little doubt that in the ensuing breeding season, at least one brood got off in the locality where this bird was seen, as in the following autumn this species was present in greater numbers than in any previous year.

February 2nd.—A Shoveler Drake (imm.) seen, which had been shot on Windermere recently.

According to the "Westmorland Gazette," a Robin's nest was discovered at Row End, near Tebay, on February 5th, containing four eggs. The nest was placed close to the lintel of a cow-byre door.

On February 16th.—Thrushes and Chaffinches were singing at Troutbeck, and on 23rd a flock of about 20 Skylarks was noted at Calgarth.

February 25th.—Rooks remained all night at one of the smaller Rookeries, for the first time this year.

At the end of this month, Mr. Arthur Astley saw a flock of 40 Pochards on Rydal, this species is undoubtedly increasing in the district, for Macpherson says he never saw a flock of more than 20 birds.

March 2nd.—Lapwings on their breeding grounds, and a Curlew was noted; this is the same date on which the latter bird was first seen last year.

March 4th.—A pair of Ravens and a pair of Peregrine Falcons were seen near a large crag, none of the birds showed any signs of having commenced nesting labours as yet.

An Oyster Catcher spent the day on the margin of Elterwater Tarn, on March 17th (A. A.), putting in there no doubt through stress of weather. At present this is the only record I possess of the species in this district.

On this date a Raven was put off its nest, which most probably contained eggs, though I was unable to ascertain this for certain. One of the birds uttered a curious metallic noise, jerking its head back as it did so.

About 5-30 p.m., a large flock of Black-headed Gulls was seen flying at a great height over Brothers' Water. A strong wind was blowing at the time, the birds descended suddenly to the surface of the lake, and commenced to bathe and preen themselves. After remaining a few minutes they rose in the air again. The birds appeared to experience some difficulty in flying owing to the strong wind, and returned to the water, it being at this time nearly dark.

About 7 o'clock, when I was nearing the top of Kirkstone, these birds passed me flying low, and making for the Windermere side of the Pass. There were in all between 200 or 300 of them.

On March 23rd a Pied Wagtail was utterly lost in the fog far up on the fells. The Meadow Pipits have returned to the hills. On this date the first Wheatear was seen in the district (A. A.)

March 24th.—An old Buzzard's eyrie has been repaired, and lined with dead bracken and grass. Some sheep's wool had been

worked into the exterior part of the nest. A Raven's nest which was visited contained nothing. It was composed of sticks, dead heather-stalks, and cosily lined with sheep's wool.

On March 31st, Mr. Arthur Astley saw a pair of Redshanks on the shore of Elterwater, they only stopped the day. A pair of Magpies are now building.

April 1st.—Two Pochard seen on Brother's Water (a pair).

April 3rd.—The first Ring Ouzel was noted near Pavey Ark.

April 4th.—Long-tailed Tit's nest, almost completed. A Missel Thrush's nest in a chestnut tree has the exterior covered with dead nettle-stalks, one of which projects at least two feet from the nest, and might have been designed to attract attention.

April 5th.—A Raven's nest contains newly-hatched young (the old bird must have sat through frost and snow-storms). The Duck Pochard was seen on Brother's Water, but no sign could be seen of the drake; this was the last time either of them were noted, I had hoped that they would have remained to breed.

April 7th.—Tufted Duck last seen on Windermere (A. A.)

April 9th.—Several Rooks' nests contained incomplete clutches, but in one instance a set of six were slightly incubated.

April 11th.—A Rook's nest seen, which was lined principally with green yew.

April 12th.—A Missel Thrush's nest observed built on a clump of heather protruding from a rock side.

Chiff-chaff first recorded (A. A.)

April 13th.—Thrush's nest found containing young.

April 14th.—Willow Wren first noted.

April 17th.—Swallow	"	} A. A.
April 19th.—Redstart	"	
April 21st.—Sandpiper	"	

Redwings at Winster (A. A.) On this date a Buzzard's eyrie was seen, which had been repaired and lined with green ivy leaves.

April 24th.—House Martin first recorded.

April 25th.—Yellow Wagtail	"	} A. A.
April 26th.—Whitethroat	"	
April 29th.—Cuckoo	"	

April 30th.—Chaffinch laid first egg.

May 4th.—Sand Martin first recorded, and Fieldfares last seen (A. A.) Noted a flock of 16 Fieldfares at Carlisle on May 8th.

May 5th.—A young Rook was seen with the extremities of the mandibles crossed after the fashion of the Crossbill. Ravens observed sparring with a Buzzard.

May 6th.—Curlew's "nest" contained one egg. (Swallows at Troutbeck in numbers for the first time.)

May 8th.—Whinchat, Blackcap, and Corncrake, first recorded (A. A.)

May 11th.—Tawny Owl's nest in hollow tree contains 3 young about 10 days old. Swift was noted for the first time (A. A.) A pair of Pied Flycatchers seen.

May 12th.—Sedge Warbler and Spotted Flycatcher first recorded (A. A.) A Tawny Owl's nest containing 2 newly-hatched young was found in a cavity in the rock of a ghyll-side; the same site was occupied two years ago.

Mr. Arthur Astley has the following interesting notes with reference to the Pied Flycatcher. He put up nesting-boxes for the first time this year, and was fortunate enough in one case to have a pair of this species for tenants. The male arrived on May 12th, the hen the following day. The nest was completed by May 17th, and contained two eggs on the 21st. This was decidedly quick work.

May 13th.—The remains of a Rook, shot recently, were seen. The beak was abnormal, the upper mandible projecting about  $\frac{3}{4}$  of an inch beyond the lower.

May 14th.—A Grouse sitting on 8 eggs, no cover near the nest, which was merely a scratching among the bent. It was infested with red ants.

May 18th.—Willow Wren's nest contained 2 eggs (A. A.) Curlew still sitting on single egg, previously mentioned.

May 20th.—Great Tit nesting in disused farm-pump.

May 25th.—A Carrion Crow's nest contained four half-fledged young. The nest was situated in a Silver Birch over-hanging a deep ghyll. Further up the same ghyll, I found a Buzzard's eyrie in a situation very easy of access. It contained one incubated egg, which was very much soiled, and had practically no natural markings. The nest was large and flat, being built on a broad bank between some small rocks.

After disturbing the old bird from the eyrie, the pair of them circled round high in the air "giving mouth" continually, they were joined by one of the Carrion Crows, which stooped at them on several occasions, the Buzzards returning the compliment.

A Meadow Pipit was disturbed from its clutch of three eggs, and trailed itself away as though badly wounded, in the vain hope of drawing us from the vicinity of its nest.

June 1st.—The Pied Flycatcher previously mentioned is now incubating six eggs. Blackbird with white secondaries seen.

June 2nd.—Visited the Buzzard's eyrie, which was found on May 25th. It still contained only one egg. Some green mountain ash twigs had been added to the nest. It was raining as the site was approached; when the bird left the nest a miniature shower fell from her back.

June 3rd.—A Kestrel's nest found in a crag, among blackberry wires, it contained four eggs. It was in almost the same situation as was occupied two years ago, and would probably belong to the same pair of birds.

June 4th.—A nesting-box placed about 25 feet from the ground in an oak tree, is tenanted by a Redstart, which is sitting on six eggs. This is an exceptional altitude for the Redstart to resort to for breeding purposes.

June 8th.—An old Rook was shot, which was in a very poor condition. On examination, it was found to have a curiously malformed beak, there being a gap where the mandibles did not meet for some distance between the base of the beak and the extremity.

June 9th.—Paid a visit to a valley in which I strongly suspected a pair of Peregrine Falcons were engaged in rearing young. Approaching some large crags it was not long until I heard the Falcon screaming, though at first no sign of her could be seen. Shortly, however, she took wing, and the nearer we drew to the centre of the crags the more demonstrative she became, her screaming was incessant, and suspicion strengthened into certainty that young were somewhere above.

Pitching on top of the rock, she continued to scream, until I started to come across on a benk in the lower part of the crag; at this she became very fierce, dashing past the face of the precipice,

and finally coming to ground again within 30 yards of me. The Tiercel now appeared and screamed, though he was not nearly so excited as the Falcon.

After pitching, the female continued her expostulations, and at length I heard her answered by young birds, which seemed to be close to her, but of which no sign could be seen. Putting her off several times, she returned to her post on each occasion screaming, the young birds usually replying.

Determining to make an attempt to reach the eyrie, I commenced to scale a steep bank, which led away towards the right of the crag. The ascent had no sooner been begun than the Falcon came dashing right at me to within a distance of 3 yards, then turning and soaring upwards. This she repeated several times, the rush of her wings sounding like the passing of an express train. As the eyrie was more nearly approached the Falcon became quieter, and drew off. Reaching the top an awkward corner had to be negotiated to reach a higher bank. This was overhung by the top part of the crag, and by crawling along it another corner was reached, and on looking round it I was delighted to see two young Peregrines.

Taking my camera from my pocket, two snap-shots were taken from a distance of about 4 feet. Then getting round to the eyrie, the young birds drew back and hissed, but did not throw themselves on their backs. The eyrie was situated on a broad bank; just above it a small bush grew out from the face of the rock. There was no nest, only one or two dead sticks lying about, which could not be by any stretch of the imagination so described. There were two natural hollows, both of which appeared to have been used equally, they were in fact adjoining, the eggs had probably been hatched in one and the young moved into the other.

The whole place was in a great mess, being very wet (although there had been no rain since the early morning), and littered with the remains of pigeons (blue chequers, etc). I could detect no other species that had served as prey. Both the young birds crops were crammed full, every thing in the way of flesh having been eaten, with the exception of what appeared to be the gizzard of a pigeon.

The young birds were, I should say, rather more than a month old, and both were in a very wet and dragged condition,

There was a good amount of down still on them, especially on the head, the covering of the pen feathers extended almost to the tips. The height from the eyrie to the foot of the crag was considerably more than 100 feet.

June 10th.—Again visited the Buzzard's nest, which on the last occasion contained one egg. The cock bird was flying about and mewing some time before we reached the site; the hen rose from the nest.

The egg was hatched; the young bird appeared to be about two days old. The beak and feet were a fleshy-yellow, the cere being brighter than the feet, the down being of course white.

Three young rabbits were lying on the edge of the nest, the head and fore-legs having gone in each case, and only the hind-legs and back remaining. There were again a few green mountain ash leaves in the nest.

On a rock end, about 40 yards below the eyrie, I found a fourth young rabbit in a similar state to the others.

Both old birds flew round while we were in the vicinity of the nest, the hen coming nearest.

June 8th.—Redstart hatching out.

June 12th.—A good view was obtained of a Tree Sparrow at Troutbeck. I was within a few yards of the bird, and could see that the whole of the upper half of the head was of a chestnut colour, and that the black gorget was rather smaller than is the case in the cock house sparrow.

June 22nd.—Nestful of young Pied Flycatchers seen in a house wall; they are nearly ready for flight.

A Buzzard's nest seen, which contained two half-fledged young. The nest was a fairly large one composed of dead sticks, and lined with grass tufts, there were also built into it larch and silver birch twigs with the foliage on them. There was no food at the nest, but on an adjoining ledge there was a great amount of rabbits' down. A Snipe was disturbed from two eggs on this date.

June 23rd.—Visited Peregrine's eyrie again; young progressing, but nothing especially noteworthy. The food in the eyrie was more interesting, there being the remains of pigeons, also a young Starling from which all the feathers had been plucked with the exception of the primaries of one wing. It had been decapitated,

and was not particularly fresh. A Redshank had also figured in the bill of fare ; this bird had most probably been brought from a small nesting colony which exists in a valley some miles distant. Some pellets taken from the eyrie were found to contain, among other things, the elytræ of beetles, the species being, I believe, *Carabus arvensis*.

June 28th.—Re-visited the Kestrel's nest found on June 3rd. The eggs had only been hatched a day or two ; the old hen remained on the four young birds until I was within a yard of her.

Again visited Buzzard's eyrie, noted May 25th and June 10th ; the food as before consisted principally of young rabbits, of which there were many bones ; I also found the remains of a young Magpie, which had, without the least doubt, provided a meal for the Buzzards.

A Spotted Flycatcher is sitting on her nest, which she has constructed within a Blackbird's old home,

June 30th.—The pair of young Buzzards are still in the eyrie (A. A.) These birds, I am glad to be able to say, ultimately got off in safety.

July 7th.—Spotted Flycatcher hatching out.

July 10th.—A Pied Wagtail's second brood emerging from the shell on this date.

On April 4th I found a Thrush's nest in some rose bushes on a house side ; it contained two eggs, the bird forsook the nest, and the eggs were removed. Some time later a bird was noticed going in and out about the same place ; making investigation on May 26th, I found that another clutch had been laid in the same nest ; these eggs were destroyed, the agent being unknown. Again noticing a bird acting in the same manner as before, I made further investigations on July 10th, and found a Thrush sitting on a clutch of four eggs, in the same nest that the other two clutches were laid in.

On July 21st, there were four half-fledged young.

The finding of three clutches in one nest in a single season, is undoubtedly very unusual.

July 20th.—A Water-hen's nest seen, built four feet above the ground in some honey-suckle, and about 20 feet from the margin of the water,

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July 23rd.—Jackdaw observed at Troutbeck, with numerous white feathers on back and wings.

July 29th.—A Hawfinch reported, which had been shot while devastating a row of peas. It was by itself. I afterwards saw this bird, but it was too far gone for preservation.

July 31st.—The young Kestrels left the "nest" (which was found on June 3rd), as soon as I came in sight of it.

August 6th.—Saw a Jackdaw which had had its legs injured. When alighting it settled on the ground with its wings spread to their utmost extent and extended on the ground. It rose again without much effort.

Heard of a brood of Golden-crested Wrens, which have not yet left the nest (A. A.)

September 3rd.—A brood of newly-hatched Swallows found in a nest from which one set of young birds have already flown this year.

The nest contains one addled egg. The young ones have only just emerged from the shell.

September 5th.—A brood of Barn Owls left the nest. There were five young birds.

September 13th.—Flocks of Lapwings and Black-headed Gulls near the shore of Windermere.

September 17th.—Gave a tame Carrion Crow a hen's egg; within half-a-minute it broke into it by vigorous blows from its beak, though it had never seen one before. It evidently knew instinctively that it was a delicacy.

September 22nd.—Several Song Thrushes seen high up on the fells, being there no doubt in search of the bilberries. I saw, near Hartsop, large flocks of Missel Thrushes. One of their number appeared at a distance to be pure white. On getting the glasses on to it, it turned out to be of a very pale fawn colour, almost white, a beautiful variety.

Numbers of these large Thrushes, together with Starlings and a few Ring Ouzels, were migrating south over Kirkstone.

September 23rd.—A brood of Barn Owls will not take to wing for at least another week. This is decidedly late.

September 29th.—Kingfishers are up the becks now, as is usual in autumn,

October 26th.—Six Blackcocks and nine Greyhens seen. I am glad to be able to say that this species is on the increase in this district. A few years ago not more than one or two birds were to be found on this ground.

October 28th.—Large numbers of Fieldfares about. Dipper singing.

November 1st.—Four Greater Spotted Woodpeckers reported as being seen in one wood recently.

November 16th.—Missel Thrush singing.

December 6th.—Hear that another Hawfinch has fallen a victim to the gun (at Ambleside).

December 7th.—On the lower slopes of Wansfell, four Magpies were seen together on the ground. On reaching the place, a quantity of rabbits' down was discovered; near by a hole passed under a boulder. Poking up this with a stick a rabbit was dislodged; it ran away apparently not much the worse. Further search revealed the fact that its seat was situated amongst some long grass close to the stone. When these circumstances are taken into consideration, it can hardly be doubted that the Magpies had made a concerted attack upon the rabbit while on its seat, probably with the object of making a meal of it.

## MAMMALS OF THE EDEN VALLEY.

By H. BRITTEN.

(Read February 2nd, 1905.)

The portion of the Eden Valley dealt with in this paper is that part between Langwathby Bridge and Armathwaite.

### CHEIROPTERA.

1. LONG-EARED BAT (*Plecotus auritus*, L.) This Bat is fairly common in the Eden valley, and I have often seen it flying during the day, though it was not until September, 1903, that I satisfied myself it was really searching for insects and not flying aimlessly about; on this occasion I saw it catch flies within a few feet of my head, and also pick flies off the water beneath the rod with which I was fishing. The day was fine, with the sun shining bright and hot.
2. PIPISTRELLE (*Pipistrellus pipistrellus*, Schreber). This is by far the most abundant species of Bat in the Eden valley. I have on different occasions known this species to take my trout flies when fishing during the evening, hooking the bat fairly in the mouth, and not merely entangling it in the line. The first occasion had rather an amusing sequel; I hooked the bat some time after dark, and as the hook seemed to be well in its mouth I decided to take the fly off my cast, and put the bat into my creel, so as to be able to get to the light when I got home. On reaching home I found the hook to be embedded in the back of the mouth and not easy to get at, so I decided to leave the bat in the creel until morning and have the benefit of daylight for the operation. Some time during the night I heard the bat fluttering around, and then succeed in getting through the hole in the lid of the creel. After flying about for some time I heard it about the fireplace. In the morning it had entirely disappeared, and I came to the conclusion it had gone up the chimney, taking my fly with it.

3. GREAT BAT OR NOCTULE (*Vesperugo noctula*, Schreber). This bat was added to our county fauna on September 5th, 1904, a specimen being shot by myself in the neighbourhood of Great Salkeld. This bat had been doubtfully recorded on one or two previous occasions, though no specimens were forthcoming to substantiate the records; in fact, the late Rev. H. A. Macpherson did not include it in his list published in the Victoria History of the county.\*

## INSECTIVORA.

4. HEDGEHOG (*Erinaceus europæus*, L.) An abundant resident in the Eden valley. I have seen 6 young in a nest, but 3 and 4 seem to be a more usual numbers.

I remember seeing a pair of these animals fighting one evening, some 20 years ago; in fact I got a scare with them, which rather impressed the incident on my memory. I was returning home after dark when I heard a lot of puffing and blowing, and as I was in a very lonely spot, and could not see anything, I felt my skin creep and my hair had a tendency to rise, but as the noise continued I was determined to find out the cause of it, and on laying down on the ground I made out two dark objects moving close to me. On crawling cautiously up to them, I found they were two hedgehogs, and I watched to see the cause of the puffing and blowing. They retreated backwards for several yards, and then advanced rapidly towards one another, making as much snorting and puffing as they possibly could. Their bristles were lowered over their foreheads, and they looked as if they intended charging one another like rams, but they never actually seemed to touch, always retreating when almost in contact. They kept this up for several minutes, when I noticed that one of them seemed to be losing heart. His puffing and blowing gradually dwindled away, and he kept himself more or less rolled up and stationary, whilst his adversary seemed to be making more noise than ever, till finally the vanquished began to cry, making an awful din. I was thankful I had

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\* Frequent on the banks of the Eden, flying in the evening before sunset.

solved the mystery before that row commenced, or I really think I should have been tempted to have taken to my heels. I have seen some hundreds of hedgehogs since that time, but I have never again seen them fighting.

5. MOLE (*Talpa europæa*, L.) This animal is abundant in the Eden valley, and though it is constantly trapped as close as possible, it never seems to become any scarcer.
6. COMMON SHREW (*Sorex araneus*, L.) Abundant in the Eden valley.
7. PYGMY SHREW (*Sorex minutus*, Pallas.) This tiny mammal is plentiful in the Parish of Great Salkeld, a considerable number having passed through my hands during the last few years.
8. WATER SHREW (*Neomys fodiens*, Pallas.) This Shrew is plentiful on the banks of the Eden and in the smaller water courses. I have several times had the pleasure of watching it hunting for insects on the bottom of a small pond. The water was from a foot to fifteen inches in depth, quite clear, with the sun shining brightly, making every movement of the shrew very distinct. It plunged into the water from between two large stones, occasionally coming out from behind them on the surface of the water and then diving, but more frequently diving behind them, and coming out into the pond underneath the end of one of these stones, which was raised a few inches above the bottom of the pond. Its movements were very rapid, and it seemed as if its body was so buoyant that it had to work hard to keep itself beneath the water. The film of air on the body, and even along the tail, was very noticeable, whilst the white underside of the body gleamed like quicksilver. It searched the bottom of the pond in a very thorough manner, turning over leaves and other debris with its long snout, searching the edges of stones embedded in the mud, and even passing underneath any which were lying slightly hollow. As soon as it made a capture, it bobbed up to the surface like a cork, and if close to the sheltering stones it swam to them on the surface of the water, but if several feet away dived to them, passing beneath the end of one stone, and coming to the surface

between them, and resting upon the sloping side of the other stone to eat whatever it had captured. On this occasion I remained watching this small animal for over a quarter of an hour, and it never rested for more than a few seconds at a time. During that period, and when I left, it was busily engaged hunting—or should I say fishing?

## CARNIVORA.

9. Fox (*Vulpes vulpes*, L.) A moderately common resident in the Eden valley, and one which is always killed whenever the opportunity occurs, as it is not hunted in this district.
10. POLECAT (*Putorius putorius*, L.) I cannot find any direct evidence of this animal in the district under consideration, and have no personal records of its occurrence, but if one may judge by the tales told by the older residents, the Polecat was by no means uncommon in the Eden valley in bygone days.
11. STOAT (*Putorius ermineus*, L.) This small mammal is still abundant in the Eden valley, and when one considers the quantity which fall victims to traps every season, it seems remarkable that it is able to hold its own. I have many times seen it chasing squirrels up trees, and it is wonderful how agile it is on the thicker branches, but the squirrel is the surer-footed on the slender twigs, and it is here that the squirrel beats it, passing up and down the tree where the stoat dares not follow, although on the thicker branches there is not much to choose between them.

I have seen numbers in their white dress every winter, and the mildness of a winter does not seem to affect this change, though it is more usual to find the female in a full white dress. I have handled both sexes quite white.

I have seen stoats swimming across streams, and have enticed them to cross by imitating the cry of a rabbit. They swim fearlessly and well. They are very fond of eggs. I have found their breeding places littered with game eggs, and the first corncrake's egg which I ever saw was taken from a stoat's breeding place,

12. WEASEL (*Putorius nivalis*, L.) This little mammal is becoming decidedly scarcer in the Eden valley, very few having been seen for several seasons, and I have heard the same report given by other gamekeepers. It is very fond of following the mole runs, and is often taken by mole-catchers in their traps. I have never seen any change from the normal colour, though I have had some hundreds of specimens through my hands.

13. OTTER (*Lutra lutra*, L.) Plentiful in the Eden valley. I have often had the pleasure of watching otters fishing the edges of streams on summer evenings, and have at different times tormented an old female with cubs until she would swim up to within a few feet of where I was standing, and have kept on annoying her to see if she would really attack me, but have never succeeded in making her do so.

I have watched them gambolling in the snow on moonlight nights, playing like kittens, and have at different times bolted them out of rabbit holes when ferreting, though one would hardly consider a ferret powerful enough to bolt an otter.

14. BADGER (*Meles meles*, L.) I have only one record of the occurrence of this animal. This was on the Skirwith Abbey estate, near to Langwathby, where one was trapped by my father somewhere about 1888.

#### RODENTIA.

15. SQUIRREL (*Sciurus leucourus*, Kerr.) This handsome mammal is abundant in the Eden valley, and can be tamed very readily. I know of two gentlemen who feed the wild squirrels, they come to the windows, and even into the house to get their usual allowance of nuts. It is not generally known that the squirrel sometimes takes to egg stealing, but I have seen them trapped in the nest, and also, some 4 years ago was told by my assistant that he had watched one of these animals sucking the eggs in a chaffinch's nest. I have also known squirrels to kill young birds, cracking the head like a nut and eating out the brains, leaving the rest of the body untouched.

16. BROWN RAT (*Mus decumanus*, Pallas.) This pest is usually very plentiful in the Eden valley, though the last few years, owing to constant trapping and killing, they are not so plentiful as formerly. This species can dive and swim almost as well as the water vole.
17. HOUSE MOUSE (*Mus musculus*, L.) Abundant everywhere, white varieties occasionally occurring.
18. WOOD MOUSE, OR LONG-TAILED FIELD MOUSE (*Mus sylvaticus*, L.) A common resident in our woods and gardens, occasionally doing a considerable amount of damage to rows of peas. I have often seen it climbing up hedges for the haws, retiring to some old nest to eat them.
19. WATER VOLE (*Microtus amphibius*, L.) An abundant resident on the banks of the Eden and its tributaries, though occasionally it will be found at a considerable distance from any water. One instance of this kind came under my notice during the present winter, when a water vole was found in a potato heap. The farmer declared it had spoiled quite a cartload of potatoes. The farm men who killed it did not know what the animal was, one calling it a "Russian rat," and saying he had never seen "owt like it afoor."
20. FIELD VOLE (*Microtus agrestis*, L.) This little pest is abundant in the Eden valley, often doing a considerable amount of damage to young plantations by eating the bark of the young trees.
21. BANK VOLE (*Evotomys glareolus*, Schreber.) I have only once seen this little mammal in the Eden valley. This was during 1905, when I trapped a specimen in my garden as it was eating the young shoots of plum grafts, but I believe it probable that it may be far from common.\*
22. HARE (*Lepus europæus*, Pallas.) This animal is becoming very scarce since the ground game Act came into force, and each year sees a decrease in its numbers. Estates where it used to swarm a few years back, have hardly a single hare left at the present time. I have several times found 3 young ones in a litter, though two is the more usual number.

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\* Further investigation proves that the Bank Vole is abundant in the Eden Valley, as it is in many other parts of the county.

23. RABBIT (*Lepus cuniculus*, L.) An abundant resident in the Eden valley. It does not seem possible to entirely kill it off, for if it is killed down until one would think there were none left, in a very short time it is as numerous as ever. White, grey and white, black, slate coloured and sandy coloured varieties often occur.

## UNGULATA.

24. FALLOW DEER (*Cervus dama*, L.) A herd of these deer are in the park at Edenhall.
25. ROE DEER (*Capreolus capreolus*, L.) Occasionally stragglers of this small deer are met with in the Eden valley, and at the present time it is supposed that several have taken up their quarters in the Coombs Wood, near Armathwaite. I heard of one having been killed and others seen. A quantity of young trees have been stripped of their bark, and the damage attributed to the roe deer.

## PLANT LIFE AROUND CARLISLE.

By T. S. JOHNSTONE.

(Read March 1st, 1906.)

It will be necessary for me to explain at the outset of this paper, that I do not propose to take in such a wide range as is indicated by the title on the Syllabus. I shall only attempt to deal with the wild Flowering plants round Carlisle, taking the word "Flower" in its common acceptation, and leaving wholly untouched the Trees, Grasses, and Rushes, and the Ferns, Mosses, and other Cryptogamous plants.

In considering how the subject should be dealt with, I came to the conclusion that the best plan perhaps would be, not to refer to my own notes merely, but, as there have been others working the same ground, to collate the information which had been recorded by others as well as myself as to the flowering plants which had been found within a radius of 5 miles from Carlisle. This is a distance which can easily be covered by any-one resident in Carlisle in the course of an afternoon's walk, and my paper, supplemented by a List as complete as I have been able to make it, will therefore shew what plants can be found, or what one may hope to find within that limit. The number I have noted in my list has, I must confess, surprised me on counting them up. There are some 900 flowering plants mentioned in Hodgson's Cumberland Flora for the entire County, and for almost exactly half of that number there are records in what I will venture to term the *Carlisle area*, as I have defined it.

While we have not the luxuriance of plant life in our colder northern climate that is to be found in the southern English Counties, yet there is perhaps in no similar area in Great Britain a greater variety of natural features. It is true we must go a little further afield to include the more rugged topography of the Fells, yet within this small compass of five miles from Carlisle we have woodland and pasture, loch and river, bog and moorland, with all their changing interest of scenery, their varying soils,

and conditions of growth, and with a corresponding diversity of plant life. We have, certainly, no alpine plants, *i.e.*, plants peculiar to the higher altitudes of Great Britain, with the exception of some rare straggler from such regions, and we have only a few Xerophilous or limestone loving plants, some of which have probably come down to us from the upper reaches of the Eden. On the whole, however, there are perhaps few similar areas which present a wider range of British wild flowering plants.

These plants represent 60 out of the 77 Orders of Flowering plants as given in Bentham & Hooker's Flora, and it will therefore be seen that a very fair acquaintance with our native flora may be gained without going far afield, and is, indeed, within the reach of everyone at the mere cost of a text-book and a little shoe leather, so to speak, and very greatly both to their mental and physical profit.

I think you will agree with me that the citizens of Carlisle ought to prize their privileges in this respect more than, perhaps, they do—yet I fancy you could easily find ten who could tell you the names of the principal football clubs and players, with a full, true, and particular account of their latest achievements, for one who could give you the names of the half-dozen commonest flowers to be found round about us. There is a story of a little London street-arab, who, after a day spent for the first time in his life in the country, returned to his native alley with wonderful tales of what he had seen, and among the marvels of the enchanted land in which he had been, the most wonderful thing he had to relate was—that he had seen shrimps growing—the fact being that the poor little fellow had seen a field of barley. We smile at the ignorance of the child, but it is perhaps not so greatly in excess after all of that of many City dwellers in regard to the common objects of the country. In large cities, such ignorance is of course more excusable, as the country is not so readily accessible, but when it lies at our doors as we in Carlisle are so fortunate as to have it, and *such* a countryside, no one with the least love of Nature in his composition can have excuse for failing to make use of his opportunities. Yet it is to be feared that the old saying is true here as in other things, that

"Familiarity breeds Contempt,"—though it is pleasant to know that more attention is now being given to Nature Study in our elementary schools which should in time produce good fruit.

In the Carlisle area there have, nevertheless, been some keen workers. The earliest of all was Bishop Nicholson, whose Manuscript Catalogue of Plants, as those who know the Cumberland Flora will be aware, is dated 1690, and who records several plants still to be found in the district, though his localities are mostly extinct.

Mr. Wm. Duckworth, who removed from Carlisle to Ulverston some years ago, and his brother Tom, seem to have worked the district very carefully, and the results of their work are embodied in two papers, read by the latter before the Cumberland and Westmorland Literary and Scientific Association, in 1883 and 1884, and which are in the printed Transactions of that Society. Later than these the Rev. Hilderic Friend explored the district very thoroughly, and many of his localities are mentioned in the Cumberland Flora, published in 1898. That work, by the late Mr. Wm. Hodgson, of Workington, as it is perhaps unnecessary to mention before this Society, was the first attempt to collate the results of the researches of the many Botanical workers in Cumberland, and Mr. Hodgson, himself a veteran Botanist, and Fellow of the Linnæan Society, personally verified the existence of more than 90% of the plants mentioned in his work. He visited every part of the County, though he had not so close an acquaintance with the Carlisle district perhaps as with the Lake district and West of Cumberland generally. My friend, Mr. Wm. Thomson, now at York, paid close attention to the district, and he and I were on many excursions together; in fact I owe it to his initiative that I happened to take up the subject, and separately or together I think we have accounted for more than two-thirds of the total number in the Carlisle area, for which records exist, while we have added a few new records to the list.

Instead of taking the list consecutively throughout, I think it may be a more suitable plan if, while adhering to Bentham & Hooker's arrangement of the Orders, we take the flowers approximately in the order of the months in which they occur.

Can we begin better than with the *Daisy*, the "wee modest crimson tipped flower," which sets seasonal classification at defiance by appearing at every season of the year from January to December. I noted it by the roadside at the beginning of last month with a keen frost on the ground and ice on all the pools, bright and wide-eyed. Less welcome, though equally ubiquitous, is the *Common Groundsel*, which may be found also in flower at any time of the year.

These apart, I think we have no others which we may expect to find in January, though in mild seasons of course an odd one may appear a little before its time, and I think you may find an odd blossom of the *Red Dead-nettle* at almost any time of the year.

FEBRUARY.—February is marked by the appearance of three visitors, the *Snowdrop*, only recorded wild in Wetheral and Corby woods; *Ulex europaeus*, the Gorse or Furze, which is of course quite common (and which is succeeded in July by *Ulex galii*, the autumnal Furze, which remains in flower until far on in November); and the third is a very common weed, *Capsella bursa-pastoris*, the *Shepherd's Purse*, a plant that grows everywhere, and may be found in flower right on up to the end of October.

MARCH.—The blustery weather we often experience in March, is rather discouraging to botanical research.

Fresh flowers are, however, beginning to make their appearance, and I have a note of some 11 which present themselves during that month. *Caltha palustris*, the *Marsh Marigold*, with its beautiful deep yellow cups, and large dark-green leaves, is to be found by the sides of streams and in swampy places—I have notes of it for Wreay woods, the Caldew, between Dalston and Cummersdale, Bellevue, and other localities.

*Viola odorata*, the *Sweet Violet*, is not common, but may be found about Cummersdale and Dalston, and there are also records for Etterby, Wetheral Bridge, and Blackwell.

The *Common Chickweed* is only too common. It remains in flower from now right on up to the end of September, side by side with the *Common Dandelion*, which, commencing now, remains in flower until the end of October.

*Potentilla fragariastrum*, the *Barren Strawberry*, is to be found in flower in this month, and is quite common by hedge banks and in woods.

*Dog's Mercury* I have recorded for Grinsdale Ghylls, Wreay woods, and Dalston, a common and well-known plant.

The flowers of *Tussilago farfara*, the *Coltsfoot*, and *Tussilago petastites*, the *Butterbur*, both appear during this month. The former is to be found almost everywhere, and seems especially to love a cinder heap or railway embankment; the latter is fond of moist situations—it is to be found by the side of all our streams around Carlisle, its curious spikes, roughly resembling those of the hyacinth, offering no suggestion of any connection with the large coarse leaves which appear abundantly later on.

The *Ground Ivy* I have noted for Dalston and Wreay woods, and Rev. H. Friend records it for Etterby and the Cemetery lane.

Perhaps the two least common March plants with us are the *Narcissus*, for which the only record is Corby woods, and *Veronica hederæfolia*, the *Ivy-leaved Speedwell*. Mr. Hodgson notes this as rare, and records it as being found at Buckabank, where I have also found it. It is also noted for Scotby and Cummersdale, and the nearest record to Carlisle is by the old Brampton road near Stanwix villa. Last year I found a solitary specimen growing further on along the same road, near the Boot Inn.

APRIL.—But it is with the advent of April that we begin to realise that the Spring is truly come.

No less than 55 new species are added to our local list during that month—many of them, however, small and inconspicuous, the timid yet hardy advance guard of the hosts to follow later on.

Beginning with the *RANUNCULACEAE*, we have the *Wood Anemone*, its delicate and beautiful white flowers having the most delightful effect as they appear in their countless profusion on grassy banks, as you may see them about Dalston or in Wreay woods.

More generally distributed still is the *Lesser Celandine*, which now presents itself everywhere—the earliest buttercup, with its glossy yellow petals.

Another buttercup, too, though less common, *Ranunculus auricomus*, Goldilocks, you will find here and there. It is noted for Wetheral and Cummersdale, and I have it recorded for Wreay woods. It is more of a woodland plant than the other.

Of the large and important order, *CRUCIFERÆ*, which includes many useful plants, and none, I think, which are harmful—an order characterised by the four petals spread out in the form of a cross—we have 6 new representatives this month. *Cardamine amara*, the large flowered bitter-cress, may be found along the left bank of the Caldew, between Cummersdale and Dalston. T. Duckworth also records it as being found on the Scar and Stainton banks.

A better known flower, *Cardamine pratensis*, the Cuckoo Flower or Meadow Bitter-cress, is to be found in most damp meadows. In Mr. Arthur Haviland's book on the prevalence of Disease in Cumberland, I find a note regarding this flower, which is rather interesting. He says:—"During the Spring succeeding the floods in 1879, when the Fluke-rot among sheep was so prevalent and destructive, the common Cuckoo Flower, which rejoices in moist meadows, was so abundant in the riparial areas of fully formed rivers that had flooded the alluvial and clayey land they had traversed during the previous autumn, that when viewed from a height the high water-mark of the floods could be traced for miles, owing to the land which they had covered being literally carpeted with the lilac-coloured flowers of this beautiful little Spring plant."

*Cardamine hirsuta*, the Hairy Bitter-cress, is another common, but inconspicuous member of the same family. Another Cruciferous plant, *Draba muralis*, the Speedwell-leaved Whitlow-grass, has the distinction of being much more rare than any of the others mentioned.

It is not recorded at all in Hodgson's Flora as having been found in Cumberland up to the date of the publication of that work in 1898. It is well established on the right-hand side of the lane, leading from Scotland Road through Messrs. Little & Ballantyne's Nurseries to Knowefield. I remember how delighted I was to have found it, some years ago, as something which I thought was new to the County, but I found afterward that my friend,

Mr. Wm. Thomson, had previously made acquaintance with it. Then we have *Draba verna*, the Vernal Whitlow-grass, a tiny plant, seldom exceeding three inches in height, but generally much less. It is frequently to be found about dry stone dykes and on old walls, and occurs in great abundance on Dalston Green, where I have noted it finer than in any other situation.

The last Cruciferous plant I have to mention is *Lepidium Smithii*, the Hairy Pepperwort. This is not quite common. I have it noted for Monkhill and Orton Moss, and the Rev. H. Friend has also records for Cargo, Durdar, and Moorhouse.

Three more violets have now to be added to our list—*Viola palustris*, the Marsh Violet, a common plant of marshy localities; *Viola hirta*, the Hairy Violet, noted by Hodgson as rare; Friend noted this for Scotby and in the grounds of Warwick Hall, and also remarks that it is plentiful about Dalston; Mr. Thomson and myself have both looked for it at Dalston, but have never had the good luck to come across it. The third violet, *Viola canina*, the Dog Violet, is of course common everywhere.

Another important order, the *CARYOPHYLLACEAE*, is represented by the Common Mouse-ear Chickweed, and Friend has a record of the Little Mouse-ear Chickweed, *Cerastium semidecandrum*, having been found by him at Cummersdale. This is the only specific mention for the Carlisle area, but as it is a plant found in the same kind of situation as the Vernal Whitlow-grass, I think further search should shew it is not so uncommon as would appear hitherto.

A more conspicuous plant of the same order is *Stellaria holostea*, the Great Stitchwort, a plant that grows profusely wherever it is found. It is common in many places around Carlisle. I have notes of it as occurring between Kirkandrews and Monkhill, at Buckabank, very fine on the Brampton Road near Drawdykes Castle, in Wreay woods, and elsewhere.

A plant now to be found in grassy places is *Geranium molle*, the Dove's-foot Cranesbill, with velvety leaves and small reddish-purple flowers, the only member of the order *Geraniaceae* yet astir.

Passing by both the large orders *Papilionaceae* and *Rosaceae*, which are unrepresented further in April, our next records are in the order *SAXIFRAGACEAE*.

On old walls about Dalston and Wetheral may be noted the Rue-leaved Saxifrage, and in moist situations about or near woods may be seen the Common or Opposite-leaved Golden Saxifrage, *Chrysosplenium oppositifolia*, and its near relative, *Chrysosplenium alternifolium*, the Alternate-leaved Golden Saxifrage, which is not quite so common. The late Mr. T. Duckworth notes the latter as having been found by him on the Scar, below St. Ann's, and Mr. Thomson got it at Wetheral. The nearest personal record I have for it is Wreay woods.

The Wild Gooseberry is frequently to be noted in hedges. I have noted it in Stainton lanes and on the road between Newtown and Bellevue. The Black Currant is also to be found here and there, but not so common. The nearest to Carlisle I have found it is on the Eden, at Grinsdale. It is also recorded by Friend as being found in Orton Moss.

In the order *UMBELLIFERAE*, which is a somewhat numerous order, characterised, generally speaking, by the umbrella-like manner in which the flower heads are spread out, only one plant appears for April, viz.: *Chaerophyllum sylvestris*, the Wild Chervil, a very common plant almost everywhere.

Now, too, appears the Moscatel, which bears the scientific name *Adoxa*, without glory, a humble little pale-green flower, plentiful in moist and shady woods and similar situations, but which is so inconspicuous that unless one looks rather closely, they are apt to pass it by.

In the order *STELLATAE*, we have the Crosswort, readily recognisable by the four-square arrangement of its closely set leaves. This is quite commonly met with—more so than another member of the same order, *Sherardia arvensis*, the Field Madder, a plant with small blue or pink flowers, for which I find noted records for Cummersdale, Dalston, Warwick, Wetheral, and Newby West.

On hedge banks, here and there, pretty well distributed throughout the district, is to be found the Lamb's Lettuce, a little plant which once was in request as a Spring salad; one never, I think, hears of its being used now for that purpose.

The flowers of the Bleaberry now appear. Mr. Duckworth notes it in Kingmoor wood, and I have it recorded for Prior Rigg lonning, Bellevue, and for Wreay woods.

The Primrose is, alas, not so plentiful as of yore, thanks to the wanton rooting up of plants wherever they are to be found within easy reach. It may still, however, be found about Dalston and Wreay woods, and I could mention some localities nearer Carlisle.

A rare plant to be found this month is *Myosotis collina*, the Dwarf Mouse-ear, one of the Forget-me-not family, recorded by Friend for Dalston and Wetheral. I have never yet been able to detect it, but still hope to succeed. Another member of the same family, however, *Myosotis versicolor*, the Changing Mouse-ear, is quite frequent round Carlisle. Its peculiarity is that the flowers, at first pale-yellow, change to pink and blue as they fade.

A very curious and scarce parasitic plant occurs in April, *Lathraea squamaria*, the Toothwort. There are several records for Cumberland, but the only place I have personally verified is in a field at Gaitsgill, mentioned by Hodgson. This plant is parasitic on the roots of several trees, but chiefly on the elm and hazel. I mention it here because it has been found in the Carlisle area, viz. : by Mr. Wm. Duckworth, at Lowhouse, near Wetheral. It is an exceedingly interesting plant. It has no leaves, but its stem is clothed with fleshy scales, and as that stem is mostly underground and in very moist soil, the plant is unable to throw off its surplus moisture by evaporation in the usual way. Now to get rid of its excess of water is a necessity for a plant, as vital as the getting rid of waste is with a human being, and this function, which in ordinary plants is performed mainly by evaporation from the leaves is, in the case of the Tooth-wort, effected by means of the direct exudation of water from the under-sides of its scales, which are hollowed out in such a manner that the process can be carried on without the possibility of interruption. This is a peculiarity unique in our native Flora, and a remarkable illustration of nature's ways in the adaptation of means to ends.

In the order *SCROPHULARINEAE*, three members of the speedwell family occur this month—*Veronica agrestis*, the Pro-cumbent Speedwell, *Veronica arvensis*, the Wall Speedwell, both common species ; and *Veronica Buxbaumii*, Buxbaum's Speedwell, which cannot be called common in the Carlisle area. I have only found it on the gravel bed opposite the Scar, and it is noted by Mr. W. Duckworth as being found at St. Ann's, Stanwix, and on

Dalston Green. Another member of the same order, which we find in moist situations, is *Pedicularis sylvatica*, the Field Lousewort.

I cannot say what has earned it this name. It is certainly a semi-parasitic plant, but I question if that fact was known when the name was given. It is not uncommon, and is to be found on Kingmoor, in Wreay woods, at Orton Moss, and in similar situations.

*Armeria maritima*, the Sea Pink, a coast plant, as its name indicates, is to be found this month on Rockcliffe marsh, its countless flowers lighting up the dull green of the marsh with a most pleasing colour effect

WILD FLOWERS RECORDED WITHIN 5-MILE  
RADIUS OF CARLISLE.

B.&H.*		B.&H.*	
L.Cat.†		L.Cat.†	
<b>RANUNCULACEAE.</b>			
3	4 <i>Thalictrum minus</i> (var. <i>montanum</i> ).	18	33 <i>Ranunculus repens</i>
4	7 <i>Thalictrum flavum</i>	20	34 <i>Ranunculus bulbosus</i>
6	9 <i>Anemone nemorosa</i>	23	37 <i>Ranunculus arvensis</i>
9	15 <i>Ranunculus fluitans</i>	24	40 <i>Caltha palustris</i>
9	20 <i>Ranunculus peltatus</i>	25	42 <i>Trollius Europaeus</i>
10	24 <i>Ranunculus hederaceus</i>	30	48 <i>Aconitum napellus</i>
10	23 <i>Ranunculus hederaceus</i> (var. <i>Lenormandi</i> )	<b>BERBERIDEAE.</b>	
12	27 <i>Ranunculus flammula</i>	33	51 <i>Berberis vulgaris</i>
12	28 <i>Ranunculus reptans</i>	<b>NYMPHAEACEAE.</b>	
13	35 <i>Ranunculus sardous</i>	34	55 <i>Nuphar alba</i>
14	39 <i>Ranunculus ficaria</i>	35	53 <i>Nuphar luteum</i>
15	25 <i>Ranunculus sceleratus</i>	<b>PAPAVERACEAE.</b>	
16	31 <i>Ranunculus auricomus</i>	37	57 <i>Papaver Rhacae</i>
17	32 <i>Ranunculus acris</i>	38	58 <i>Papaver dubium</i>
		40	59 <i>Papaver argemone</i>
		42	65 <i>Chelidonium majus</i>
		<b>FUMARIACEAE.</b>	
		45	74 <i>Fumaria officinalis</i>
		46	67 <i>Corydalis lutea</i>
		47	68 <i>Corydalis claviculata</i>

\* Bentham and Hooker's British Flora, 6th Edition, 1896.

† London Catalogue of British Plants, 9th Edition, 1895.

**CRUCIFERAE.**

- 51 84 *Barbarea vulgaris*  
 52 80 *Nasturtium officinale*  
 54 82 *Nasturtium palustre*  
 58 93 *Arabis hirsuta*  
 61 120 *Arabis Thaliana*  
 64 96 *Cardamine amara*  
 65 97 *Cardamine pratensis*  
 66 100 *Cardamine impatiens*  
 67 98 *Cardamine hirsuta*  
 67 99 *Cardamine flexuosa*  
 70 121 *Sisymbrium officinale*  
 73 126 *Alliaria officinale*  
 75 128 *Erysimum orientale*  
 76 142 *Brassica tenuifolia*  
 80 132 *Brassica napus*  
 82 139 *Brassica sinapis*  
 83 137 *Brassica nigra*  
 85 118 *Cochlearia armoracia*  
 86 112 *Cochlearia officinalis*  
 86 113 *Cochlearia alpina*  
 87 103 *Alyssum calycinum*  
 92 105 *Draba muralis*  
 93 109 *Draba verna*  
 94 129 *Camelina sativa*  
 96 153 *Thlaspi arvense*  
 102 144 *Capsella Bursa-pastoris*  
 103 150 *Lepidium campestre*  
 104 151 *Lepidium Smithii*  
 113 162 *Raphanus raphanistrum*

**RESEDACEAE.**

- 114 166 *Reseda luteola*  
 115 165 *Reseda lutea*

**VIOLACEAE.**

- 121 172 *Viola palustris*  
 122 173 *Viola odorata*

- 123 174 *Viola hirta*  
 125 176 *Viola canina*  
 126 181 *Viola tricolor*

**POLYGALACEAE.**

- 127 185 *Polygala vulgaris*

**CARYOPHYLLACEAE.**

- 133a 199 *Saponaria vaccaria*  
 135 201 *Silene cucubalus*  
 141 213 *Lychnis vespertina*  
 142 214 *Lychnis diurna*  
 143 218 *Lychnis githago*  
 144 215 *Lychnis flos-cuculi*  
 147 253 *Sagina procumbens*  
 157 242 *Arenaria trinervis*  
 160a 224 *Cerastium glomeratum*  
 160a 224 *Cerastium glomeratum* (var. *b. apetalum*)  
 160b 225 *Cerastium triviale*  
 160c 223 *Cerastium semidecandrum*  
 165 231 *Stellaria nemorum*  
 166 232 *Stellaria media*  
 167 237 *Stellaria uliginosa*  
 170 234 *Stellaria holostea*  
 172 259 *Spergula arvensis*

**PORTULACAEAE.**

- 174 266 *Claytonia perfoliata*  
 175 267 *Montia fontana*

**HYPERICINEAE.**

- 181 275 *Hypericum perforatum*  
 182 276 *Hypericum dubium*  
 184 279 *Hypericum humifusum*

- 186 281 *Hypericum pulchrum*  
 187 282 *Hypericum hirsutum*  
 188 283 *Hypericum montanum*

**LINACEAE.**

- 190 302 *Linum usitatissimum*  
 193 299 *Linum catharticum*  
 184 298 *Radiola millegrana*

**MALVACEAE.**

- 196 291 *Malva rotundifolia*  
 197 290 *Malva sylvestris*  
 198 289 *Malva moschata*  
 199 285 *Althaea officinalis*

**GERANIACEAE.**

- 203 306 *Geranium phacum*  
 204 307 *Geranium sylvaticum*  
 205 308 *Geranium pratense*  
 207 316 *Geranium Robertianum*  
 208 315 *Geranium lucidum*  
 209 310 *Geranium molle*  
 213 314 *Geranium columbinum*  
 214 317 *Erodium cicutarium*  
 217 320 *Oxalis acetosella*

**ACERACEAE.**

- 221 331 *Acer campestre*

**AQUIFOLIACEAE.**

- 223 326 *Ilex aquifolium*

**RHAMNACEAE.**

- 226 329 *Rhamnus frangula*

**PAPILIONACEAE.**

- 227 336 *Ulex Europaeus*  
 227 337 *Ulex Galii*  
 228 333 *Genista anglica*  
 229 335 *Genista tinctoria*  
 232 339 *Cytisus scoparius*  
 233 340 *Ononis repens*  
 233 341 *Ononis spinosa*  
 236 344 *Medicago sativa*  
 237 347 *Medicago lupulina*  
 241 351 *Melilotus officinalis*  
 246 249 *Trifolium arvensis*  
 249 356 *Trifolium pratense*  
 250 357 *Trifolium medium*  
 252 365 *Trifolium striatum*  
 263 375 *Trifolium procumbens*  
 264 376 *Trifolium minus*  
 266 379 *Lotus corniculatus*  
 268 378 *Anthyllis vulneraria*  
 275 389 *Ornithopus perpusillus*  
 279 394 *Vicia tetrasperma*  
 278 393 *Vicia hirsuta*  
 280 396 *Vicia cracca*  
 283 399 *Vicia sepium*  
 284 403 *Lathyrus aphaca*  
 291 411 *Lathyrus pratensis*  
 296 417 *Lathyrus macrorrhizus*

**ROSACEAE.**

- 298 419 *Prunus spinosa*  
 298 420 *Prunus insititia*  
 299 421 *Prunus domestica*  
 299 422 *Prunus avium*  
 300 424 *Prunus padus*  
 302 426 *Spiraea Ulmaria*  
 303 427 *Spiraea filipendula*

- 305 529 *Geum urbanum*  
 306 530 *Geum rivale*  
 308     *Rubus*  
 312 531 *Fragaria vesca*  
 313 535 *Potentilla Fragarias-*  
       *trum*

- 314 540 *Potentilla reptans*  
 315 538 *Potentilla tormentilla*  
 320 541 *Potentilla anserina*  
 322 545 *Potentilla palustris*  
 323 548 *Alchemilla vulgaris*  
 324 547 *Alchemilla arvensis*  
 326 555 *Sanguisorba officinalis*  
 327 553 *Poterium sanguisorba*  
 328 551 *Agrimonia Eupatoria*  
 330 559 *Rosa mollis*  
 331 561 *Rosa rubiginosa*  
 332 565 *Rosa canina*  
 333 568 *Rosa arvensis*  
 334 584 *Pyrus communis*  
 335 586 *Pyrus malus*  
 338 583 *Pyrus Aucuparia*  
 339 588 *Crataegus Oxyacan-*  
       *tha*

**ONAGRACEAE.**

- 343 647 *Epilobium hirsutum*  
 345 649 *Epilobium montanum*  
 353 661 *Circae Lutetiana*

**LYTHRARIÆÆ.**

- 355 644 *Lythrum Salicaria*  
 357 643 *Peplis portula*

**CRASSULACEAE.**

- 360 616 *Cotyledon umbilicus*  
 362 618 *Sedum Telephium*  
 367 623 *Sedum acre*  
 371 628 *Sempervivum tecto-*  
       *rum*

**RIBESIACEAE.**

- 372 611 *Ribes grossularia*  
 375 614 *Ribes nigrum*

**SAXIFRAGACEAE.**

- 381 601 *Saxifraga granulata*  
 384 598 *Saxifraga tridacty-*  
       *lites*  
 389 608 *Chrysosplenium op-*  
       *positifolium*  
 390 609 *Chrysosplenium al-*  
       *ternifolium*

**DROSERACEAE.**

- 392 629 *Drosera rotundifolia*  
 393 631 *Drosera longifolia*  
 394 630 *Drosera anglica*

**HALORAGEAE.**

- 395 634 *Myriophyllum spica-*  
       *tum*

**UMBELLIFERAE.**

- 398 664 *Hydrocotyle vulgare*  
 399 668 *Sanicula Europaea*  
 405 678 *Apium nodiflorum*  
 409 691 *Aegopodium podag-*  
       *raria*  
 412 682 *Carum verticillatum*  
 416 690 *Sium erectum*  
 417 692 *Pimpinella saxifraga*  
 419 672 *Bupleurum rotundi-*  
       *folium*  
 423 704 *Oenanthe fistulosa*  
 425 708 *Oenanthe crocata*  
 427 711 *Aethusa cynapium*  
 428 702 *Foeniculum vulgare*

- 431 713 *Silva pratensis*  
 434 717 *Angelica sylvestris*  
 439 723 *Heracleum sphondylium*  
 441 697 *Scandix pecten-veneris*  
 442 695 *Myrrhis odorata*  
 443 694 *Conopodium denudatum*  
 444 696 *Chaerophyllum temulum*  
 445 699 *Chaerophyllum sylvestris*  
 446 698 *Chaerophyllum anthriscus*  
 447 732 *Caucalis nodosa*  
 448 731 *Caucalis anthriscus*  
 450 729 *Caucalis daucoides*  
 451 728 *Caucalis latifolia*  
 452 726 *Daucus carota*  
 453 670 *Conium maculatum*

**ARALIACEAE.**

- 457 733 *Hedera helix*

**CAPRIFOLIACEAE.**

- 461 736 *Adoxa moschatellina*  
 465 739 *Viburnum opulus*  
 466 743 *Lonicera periclymenum*

**STELLATAE.**

- 471 747 *Galium cruciata*  
 472 748 *Galium verum*  
 473 753 *Galium palustre*  
 474 754 *Galium uliginosum*  
 475 751 *Galium saxatile*  
 476 750 *Galium mollugo*

- 479 757 *Galium aparine*  
 480 758 *Galium tricornis*  
 481 759 *Asperula odorata*  
 483 763 *Sherardia arvensis*

**VALERIANACEAE.**

- 485 764 *Valeriana dioica*  
 486 766 *Valeriana officinalis*  
 488 770 *Valerianella olitoria*  
 490 773 *Valerianella auricula*  
 491 774 *Valerianella dentata*

**DIPSACEAE.**

- 492 775 *Dipsacus sylvestris*  
 494 777 *Scabiosa succisa*  
 496 779 *Scabiosa arvensis*

**COMPOSITAE.**

- 497 781 *Eupatorium cannabinum*  
 502 787 *Erigeron Canadense*  
 503 782 *Solidago virga-aurea*  
 504 783 *Bellis perennis*  
 505 790 *Filago Germanica*  
 506 793 *Filago minima*  
 511 797 *Gnaphalium uliginosum*  
 518 806 *Inula dysenterica*  
 521 810 *Bidens cernua*  
 521 810 *Bidens cernua* (var. *b. radiata*)  
 522 811 *Bidens tripartita*  
 523 821 *Chrysanthemum leucanthemum*  
 524 820 *Chrysanthemum segetum*  
 525 822 *Chrysanthemum parthenium*  
 526 823 *Matricaria inodora*

[illegible]

**CONVOLVULACEAE.**

- 686 1129 Convolvulus arvensis  
687 1127 Convolvulus sepium

**BORAGINEAE.**

- 692 1125 Echium vulgare  
696 1124 Lithospermum arvense  
699 1114 Myosotis caespitosa  
699 1115 Myosotis palustris  
699 1116 Myosotis repens  
700 1118 Myosotis sylvatica  
701 1119 Myosotis arvensis  
702 1120 Myosotis collina  
703 1121 Myosotis versicolor  
705 1109 Anchusa semper-virens  
706 1110 Lycopsis arvensis  
707 1105 Symphytum officinale  
708 1106 Symphytum tuberosum  
709 1107 Borago officinalis  
710 1104 Asperugo procumbens  
711 1102 Cynoglossum officinale  
714 1139 Hyoscyamus niger

**SOLANACEAE.**

- 715 1134 Solanum dulcamara  
716 1135 Solanum nigrum

**OROBANCHACEAE.**

- 725 1207 Lathraea squamaria

**SCROPHULARINEAE.**

- 726 1140 Verbascum Thapsus  
732 1155 Antirrhinum majus

- 734 1153 Linaria vulgaris  
735 1152 Linaria repens  
739 1146 Linaria cymbalaria  
742 1159 Scrophularia nodosa  
743 1157 Scrophularia aquatica  
746 1162 Mimulus luteus  
747 1163 Limosella aquatica  
749 1165 Digitalis purpurea  
753 1173 Veronica serpyllifolia  
754 1178 Veronica officinalis  
755 1182 Veronica anagallis  
756 1183 Veronica Beccabunga  
757 1181 Veronica scutallata  
758 1180 Veronica montana  
759 1179 Veronica chamaedrys  
760 1166 Veronica hederifolia  
761 1168 Veronica agrestis  
762 1169 Veronica Buxbaumii  
763 1172 Veronica arvensis  
768 1185 Bartsia odontites  
769 1184 Euphrasia officinalis  
770 1190 Rhinanthus Cristagalli  
771 1188 Pedicularis palustris  
772 1189 Pedicularis sylvatica  
775 1194 Melampyrum pratense

**LABIATAE.**

- 779 1232 Lycopus Europaeus  
780 1220 Mentha sylvestris  
781 1218 Mentha rotundifolia  
788 1234 Thymus serpyllum  
789 1233 Origanum vulgare

- 790 1237 Calamintha acinos  
 792 1236 Calamintha clinopodium  
 793 1245 Nepeta glechoma  
 795 1248 Prunella vulgaris  
 800 1251 Stachys Betonica  
 802 1254 Stachys sylvatica  
 803 1253 Stachys palustris  
 803 1253 Stachys ambigua  
 804 1255 Stachys arvensis  
 807 1261 Galeopsis tetrahit  
 807 1261 Galeopsis tetrahit  
       (var. b. bifida)  
 807 1260 Galeopsis versicolor  
 808 1270 Ballota nigra  
 809 1262 Leonurus cardiaca  
 811 1266 Lamium purpureum  
 811 1266 Lamium purpureum  
       (var. incisum)  
 812 1268 Lamium album  
 814 1269 Lamium galeobdolon  
 815 1274 Teucrium Scorodonia  
 819 1275 Ajuga reptans

**VERBENACEAE.**

- 822 1217 Verbena officinalis

**PLUMBAGINEAE.**

- 826 1058 Armeria maritima

**PLANTAGINEAE.**

- 828 1278 Plantago major  
 829 1279 Plantago media  
 830 1280 Plantago lanceolata  
 831 1281 Plantago maritima  
 832 1282 Plantago coronopus  
 833 1284 Littorella lacustris  
 837 1290 Scleranthus annuus

**CHENOPODIACEAE.**

- 845 1296 Chenopodium album  
 851 1305 Chenopodium Bonus-Henricus

**POLYGONACEAE.**

- 858 1345 Rumex aquaticus  
 859 1344 Rumex crispus  
 860 1343 Rumex obtusifolius  
 861 1346 Rumex Hydrolapathum  
 862 1337 Rumex conglomeratus  
 863 1339 Rumex sanguineus  
 866 1348 Rumex acetosa  
 867 1350 Rumex acetosella  
 869 1323 Polygonum aviculare  
 871 1321 Polygonum convolvulus  
 874 1333 Polygonum bistorta  
 875 1332 Polygonum amphibium  
 876 1329 Polygonum persicaria  
 877 1330 Polygonum lapathifolium  
 878 1326 Polygonum hydropiper  
 879 1327 Polygonum minus  
 1335 Fagopyrum esculentum

**EUPHORBIACEAE.**

- 886 1359 Euphorbia helioscopia  
 890 1371 Euphorbia peplus  
 897 1375 Mercurialis perennis

**CALLITRICHINEAE.**

- 902 636 Callitriche verna

**URTICACEAE.**

- 903 1382 *Urtica urens*  
905 1380 *Urtica dioica*  
906 1383 *Parietaria officinalis*  
907 1379 *Humulus lupulus*

## AMENTACEAE.

- 910 1384 *Myrica gale*  
912 1385 *Betula alba*  
914 1390 *Carpinus Betulus*  
921 1395 *Salix triandra*  
922 1411 *Salix purpurea*  
922 1411 *Salix rubra*  
923 1405 *Salix viminalis*  
924 1399 *Salix cinerea*  
924 1401 *Salix caprea*  
925 1400 *Salix aurita*  
927 1402 *Salix repens*

**TYPHACEAE.**

- 939 1556 *Typha latifolia*  
941 1558 *Sparganium ramo-*  
sum

- 942 1560 Sparganium simplex

**AROIDEAE.**

- 944 1563 *Arum maculatum*  
945 1585 *Acorus calamus*

**LEMNACEAE.**

- 947 1567 Lemna minor

**NAIADEAE.**

- |     |      |              |                |
|-----|------|--------------|----------------|
| 956 | 1610 | Zannichellia | palustris      |
| 958 | 1580 | Potamogeton  | natans         |
| 958 | 1581 | Potamogeton  | polygonifolius |
| 962 | 1595 | Potamogeton  | perfoliatus    |
| 963 | 1596 | Potamogeton  | crispus        |
| 964 | 1597 | Potamogeton  | densus         |
| 967 | 1602 | Potamogeton  | pusillus       |

- 970 1577 Triglochin palustre  
971 1578 Triglochin mariti-  
mum

**ALISMACEAE.**

- 972 1576 *Butomus umbellatus*  
975 1572 *Alisma ranuncul-*  
ooides

- 974 1571
- Alisma plantago*

## HYDROCHARIDAE.

- 978 1424 Elodca Canadensis

**ORCHIDACEAE.**

- 984 1441 *Epipactis latifolia*  
989 1432 *Listera ovata*  
999 1448 *Orchis ustulata*  
1000 1453 *Orchis mascula*  
1002 1457 *Orchis maculata*  
1006 1468 *Habenaria bifolia*  
1007 1464 *Gymnadenia conopsea*

**IRIDEAE.**

- 1017 1472
- Iris pseudacorus*

**AMARYLLIDAE.**

- 1024 1481 *Narcissus pseudo-*  
narcissus  
1026 1486 *Galanthus nivalis*

**LILIACEAE.**

- |      |      |                              |
|------|------|------------------------------|
| 1029 | 1525 | Paris quadrifolia            |
| 1031 | 1493 | Polygonatum multi-<br>florum |
| 1040 | 1520 | Gagea lutea                  |
| 1041 | 1514 | Ornithogalum um-<br>bellatum |
| 1046 | 1512 | Scilla nutans                |
| 1049 | 1499 | Allium scorodo-<br>prasm     |
| 1053 | 1501 | Allium vineale               |
| 1054 | 1508 | Allium ursinum               |
| 1059 | 1522 | Colchicum autum-<br>nale     |

## THE WADING BIRDS OF THE SOLWAY.

By T. L. JOHINSTON.

(Read March 16, 1905)

This interesting order of birds is well represented on the Solway, a good list of thirty-five species having been recorded in the area of my observations, *i.e.*, the Cumberland side of the Firth, and of these I have met with the twenty-seven species mentioned in this paper.

Nine only of these twenty-seven species may be classed as residents, being present at all seasons of the year, two, the Dotterel and Common Sandpiper, are summer migrants, breeding in Cumberland; the remainder are migratory species, which visit the Solway on their way to or from their breeding grounds.

Most of the migrant species are regular annual visitors, but others such as the Phalaropes, Great Snipe, Purple Sandpiper and Black-tailed Godwit, are irregular in their visits, whilst the Cream-coloured Courser, Collared Pratincole and Buff-breasted Sandpiper, have each only a single record.

An interesting feature of the *Limicolæ* is their highly developed migratory instinct, some species covering over twenty thousand miles during their annual journey. When on migration they frequently travel at a great height, quite out of the range of vision of man. I remember on one occasion hearing the note of Whimbrel passing overhead, and although the day was perfectly fine and clear it was only with great difficulty I could discern them, looking like specks in the cloudless sky.

Many of the migrants stay only a short time on the Solway, continuing their journey after resting awhile, but some as the Grey Plover, Turnstone, Knot and Bar-tailed Godwit, remain throughout the winter if food is sufficiently plentiful, departing in spring for their more northern breeding places.

Of Limicoline birds, the Dotterel, *Eudromias morinellus*, is our rarest breeding species in Cumberland. Some few pairs probably still breed annually in the lake district, but it is best known as a spring migrant, when it passes through the county on its way to breeding grounds further north.

The Dotterel visits the Solway early in May, sometimes in April or even March, but only remains a few days. I have seen parties of these birds on two occasions, once on May 16th, 1903, I walked close up to a party of six birds without disturbing them; they are by no means shy. When feeding on a dry fallow field they are very difficult to see, their colours blending well with the dead grass and herbage.

The Golden Plover, *Charadrius pluvialis*, is chiefly a winter visitor to the Solway, though once a breeding species on the flows. It is now generally distributed along the eastern moorlands as a nesting species. Small parties, probably home-bred birds, arrive on the Solway in August and September; they are tame at this time and easily approached. I have walked within gunshot of them when sitting on the marshes, but they soon become wild after staying a few days. During open weather they resort year after year to certain pasture and fallow fields, and I have seen several hundreds of Plovers and Lapwings feeding in certain fields within the boundaries of the city of Carlisle.

The Grey Plover, *Squatarola helvetica*, is an autumn migrant, arriving on the Solway during August and September, many birds spending the winter with us, and leaving in the spring for their breeding grounds in the Arctic regions. The young birds generally arrive first, followed later by the adults, some of which still retain their splendid summer dress, and are known to the wildfowlers as Black-breasted or Silver Plovers. Grey Plovers are almost purely shore birds, but I once met with a single bird inland at Newlaithes Hall, near Carlisle, in November of 1898. They are very wary birds, especially the adults, which usually keep well out of shot.

The Ringed Plover, *Ægialitis hiaticula*, is numerous all along the coast of Cumberland, where it is known as the "sea bellet." In autumn and winter it frequents the shingle beds and sandbanks of the Firth in company with Dunlins, and in spring large migrant flocks arrive, probably birds on their way to their nesting

ground. On May 21st, 1903, I saw a flock of over 600 Ringed Plovers on one of the Solway marshes, they were scattered all over the marsh, and were very restless and wild; at a distance they looked like bits of paper blown about by the wind. When not molested, Ringed Plovers are very partial to certain places for breeding purposes, and will return to the same place year after year. They nest in suitable places all along the Solway, also on shingle beds on the River Eden, below and above Carlisle. Two broods are usually reared, sometimes even three, but the second clutch of eggs often consists of three only. I have seen eggs and young in the month of August.

The Lapwing, *Vanellus cristatus*, known locally as "peeweep," and on the coast as "teufit," is the commonest of our wading birds, breeding all over the county. In autumn large flocks arrive from northern countries, and unite with our home-bred birds. In the autumn of 1902, the flocks of migrants were exceptionally large, and during the first fortnight of October, Burgh Marsh alone held birds which I estimated at 10,000, and the other marshes held proportionate numbers. Lapwings are the earliest birds to flock together, sometimes being in small parties by the middle of July. During open weather they visit fallow and pasture inland, but a spell of frost quickly drives them to the coast. When frequenting the fields they usually have Black-headed and Common Gulls feeding with them, and if a Lapwing picks up a dainty morsel, it is sure to be seen by the gulls, which will chase it until it drops the food. Towards evening they are very noisy and unsettled, and as they proceed to their accustomed resting places (which is frequently a turnip field partly eaten off by sheep), they perform some curious aerial evolutions. During these evening passages, the flocks fly scattered, generally in two's or three's, and the same may be said when feeding, a flock of birds covering a very large area of ground. Towards the end of March the flocks begin to break up, and the pairing commences; their habits now change, and instead of being shy and restless, they allow a near approach. The nest, which is a slight depression on the ground, lined very scantily with dried grass or straw, is found in a variety of places, such as marsh land, pasture fields, fallow land, or on the top of a turnip stitch. I have seen as many as 16 nests in the same field.

but on the marshes the nests are more scattered, although on some parts of them one may find several nests within a short distance of each other. When the young are hatched, the old birds fly close over one's head crying plaintively, tumbling to the ground, then rising again in the endeavour to entice an intruder from the vicinity of the young, which are crouching amongst the grass.

The Turnstone, *Streptilas interpres*, is a migrant of the spring and autumn. In spring Turnstones generally arrive on the coast about the 3rd week in May. These are adult birds on their way to their breeding grounds in the Arctic circle; they only stay for a day or two. They are by no means shy, and on several occasions I have walked within a short distance of them, and watched them feeding. On May 14th, 1904, I fell in with a small party of 5 birds in company with Ringed Plover and Dunlin, near Silloth. I walked to within 20 yards of them without concealing myself, and watched them feeding. After a time the Plovers and Dunlins began to get restless, this alarmed the Turnstones, and the next movement on my part set the whole on flight, the Turnstones going away by themselves. When feeding on the mussel scaurs it is almost impossible to see Turnstones, so well does their plumage harmonise with their surroundings.

The Oyster Catcher, *Hæmatopus ostralegus*, is a common bird along the coast of Cumberland, and is known as the "Sea Piet." It is one of the most conspicuous birds of the Solway, where in autumn and winter large flocks may be seen frequenting the mussel scaurs and sand banks. During the flow of the tide they fly up the firth in small parties, generally close over the water, calling loudly the while, and as they reach an exposed sand bank, settle on it until the tide covers it. When the tide is full they rest on the higher marshes until the ebb commences, when they follow the receding tide in search of food, which consists of mussels, whelks and other molluscs (which they scoop out of the shell with their powerful beak), as well as leaves and shoots of marine plants. The flight of the Oyster Catcher is rapid and powerful, and it is a fine sight to see a party chased by a Peregrine Falcon. In September, 1898, on one of the Solway marshes, a small flock passed me at a tremendous pace; looking up I saw a Peregrine following them. The falcon was not long in overtaking them,

and selecting the last bird of the flock as the victim, knocked it to the ground, then following the flock repeated the performance.

This appeared to be play on the part of the Peregrine, as it did not seize the bird after striking, and both birds seemed to be unhurt as they flew away.

During the breeding season they frequent the shingle and marshes round the coast. They also breed on the shingle beds on the River Eden, both below and above Carlisle. The nest is a hollow formed by the birds, and if among shingle is lined with very small stones and bits of shell. When breeding on marshes, I have seen bits of dried grass in the hollow, and once found a nest among some wreckage left by the tide. They have a curious habit of forming several nests, and I have seen as many as eight nests made by one pair of birds, seven of them empty and unused, the eighth containing three eggs. The eggs, which are generally three in number, but sometimes four, vary considerably in colour and markings, those laid on dark marsh land being usually darker in ground colour than those deposited on shingle. The eggs being large, are not difficult to find by an experienced person, but a novice will often pass them, so well do they match their surroundings, especially when on shingle. The young are able to run and feed themselves as soon as hatched, and their colouring blends with their surroundings even better than the eggs.

The Woodcock, *Scolopax rusticola*, is seldom seen on our coast, but is fairly numerous in woods and coverts throughout the county, including those near the Solway. In autumn the home-bred birds have their numbers largely supplemented by migrants from the Continent.

The Woodcock is a shy and retiring bird, hiding up by day in the densest cover, but as evening approaches it takes flight, and may then be seen in the open spaces of a wood, flying with the bill held at a somewhat acute angle with the body, and uttering its clear whistling note. It is yearly increasing as a breeding species, nesting in nearly every suitable locality, the nest being usually well hidden beneath a bush or shrub. The number of eggs in a clutch is four, and they are rounder in outline than the usual *Linicoline* type.

The Common Snipe, *Scolopax gallinago*, is a very local breeding species in the Solway district, but in autumn large flocks of migrants arrive. Like the Woodcock, the Snipe is seldom seen during the day, except in the breeding season, when it may be seen and heard "drumming" over its nest at any hour. Snipe delight to feed in small streams with a muddy bottom, but are frequently found on the marshes and mosses bordering the Solway. When disturbed they rise with a zig-zag flight as if undecided which way to go. They appear to have a great liking for certain places, and there is an old saying in the district: "Once a Snipe hole, always a Snipe hole," and I have found it to hold good. During the winter of 1896, Snipe were in very large numbers in a turnip field, which had lain under water after heavy rain until the crop was mostly decayed, they frequented this field for several weeks, and I estimated their numbers at seven or eight hundred birds.

The Jack-Snipe, *Scolopax gallinula*, occurs in very limited numbers, and is local in its distribution. It arrives towards the end of September or early in October, and frequents a similar habitat to the common Snipe. When disturbed it flies a short distance, but soon settles again. On arrival Jack-Snipe are very tame, and on one occasion I nearly caught one with my hat whilst the bird was feeding in a small stream, within the boundaries of the city of Carlisle.

The Dunlin, *Tringa alpina*, is one of the commonest birds of the shore, and is known locally as the "Sea Mouse." In autumn large flocks on migration visit the Solway, and again in spring on their return to their breeding grounds.

In autumn Dunlins are wary, and will not allow a near approach, the flocks breaking up when danger appears. When the tide is at full they rest on the higher marsh land and sea beach, preening their plumage and sleeping, usually guarded by the wary Ringed Plover. In spring their habits change, and instead of the excessive wariness shown in autumn, one may walk close to them.

Although a common bird on the marsh and seashore, it is by no means a common breeding species, and many of the birds which pass the summer on the Solway appear to be non-breeding birds. The nest of the Dunlin is generally well concealed, placed in a tuft of grass with a slight lining of dead grass, and is found on

the hills and mosses as well as on the marsh land. At nesting time one may see the old birds mount into the air after the manner of Pipits, and when descending their note is a curious trill, which is continued as the bird flies rapidly just above the ground. The eggs are generally four in number, and very variable in colour and markings, some clutches having all four eggs marked differently. The young are able to run and feed as soon as hatched.

The Little Stint, *Tringa minuta*, is the smallest of the wading birds, and an autumn visitor to the Solway, usually occurring in small parties. I have not seen an adult bird of this species obtained on the Solway, those which visit us being birds in the first autumn dress. Its habits resemble the Dunlin, with which species it frequently consorts, only its smaller size distinguishing it from that bird. It arrives on the Solway in the latter half of September, stays a short time, and passes south, but I have seen a bird obtained as late as December, shot from a flock of Lapwings.

The Purple Sandpiper, *Tringa striata*, is seldom seen on the upper part of the Solway, it prefers a rocky coast, and I have seen it several times on the east coast. One frequented a mussel scaur, near Silloth, for a few weeks in 1905, and one was shot in 1906 at the same place.

The Knot, *Tringa canutus*, is a very common autumn visitor to the Solway, where it is called the "Grey Knot." Small parties of adult birds arrive about the beginning of August, followed later by large flocks consisting of both adults and young. On arrival they are quite fearless, probably due to the fact that they are not disturbed during their breeding time in that remote breeding place which still remains to be discovered.\* Occasionally adults arrive in the red breeding dress, and sometimes a few non-breeding birds spend the summer on the Solway. Their food consists of small molluscs, which they obtain on the scaurs and sands. In certain seasons these scaurs are covered by mud brought down by the high tides; when this happens the Knots soon leave the place.

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\* The Knot has, since date of this paper, been discovered breeding in Northern Siberia and Taimyr Peninsula. (Eds.)

The Curlew Sandpiper, *Tringa subarquata*, is an autumn visitor to the Solway, occurring some seasons in numbers, but it is not well known to the ordinary gunner. It generally consorts with Dunlins or Redshanks, but occasionally one may see a solitary bird. The nesting place of the Curlew Sandpiper was not discovered until 1897, when M. H. L. Popham found its eggs in the Yenesei Valley, Siberia.

The handsome and interesting Ruff, *Machetes pugnax*, is now only known to us as a migrant, having practically ceased to breed in the British Isles.\* During autumn it visits the Solway in small flocks, and these are usually birds of the year. It is generally found in company with Redshanks, but I have seen it on several occasions alone, once as late as October 8th.

The Sanderling, *Calidris arenaria*, is both a spring and autumn visitor to the Solway, sometimes occurring in large flocks. The spring migrants arrive in May and June, resting a short time on their way to their breeding ground, and I have met with them on their southward autumn migration as early as the 1st of August. It is somewhat irregular in the numbers which visit us, few being seen in some seasons, in others flocks of thousands. Stragglers are seen throughout the winter frequenting the sand banks well out in the firth, whereas in spring and autumn they are usually close in to shore.

The Common Sandpiper, *Totanus hypoleucus*, is one of our summer visitors, and breeds all over the county where ever suitable ground exists. It is amongst the earliest of spring migrants and may be seen by the 16th April. The note is a shrill weet, and is uttered as it rises on the wing, developing into a piping cry as the bird flies along just above the surface of the water, with rapid strokes of the wings, at times sailing with outstretched wings until it reaches some boulder, where it rests with a curious bobbing motion as if it were unevenly balanced. During the breeding season the males are very noisy, at times soaring into the air uttering a trill, and when descending will frequently alight on a post. I have on two occasions seen one settle on a hawthorn hedge, once on a tree. The nest, which is very difficult to locate, is placed in a variety

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\* The Ruff bred in Norfolk in 1907, and in Yorkshire in 1901-2-3. (Eds.)

of situations, sometimes on the bank of a river underneath the leaves of coltsfoot or butter burr, amongst gorse bushes, or in a bunch of nettles, and I have heard of a nest being found on the railway side, some distance from any water. When incubation commences the Sandpiper sits very close, and I have hidden within two yards of one sitting on its nest. In June, 1895, a pair were nesting amongst some thick gorse bushes on the River Caldew, near Dalston, where I sought unsuccessfully for the nest, but returning a day or two later, I flushed both birds and hid up to watch their return; after waiting some time and not seeing the birds, I decided to leave, but just as I moved I caught a gleam of the bird's eye scated on her nest less than two yards from where I lay. After the breeding season, Sandpipers flock, and sometimes as many as fifty birds may be seen flying down stream calling loudly. They frequent the creeks of the Solway marshes in small parties for some days before uniting in large flocks for migration. They are frequently heard passing over Carlisle on their journey south,

The Green Sandpiper, *Totanus ochropus*, is on'y known on our coast as an autumn migrant, and only occurs in very limited numbers. It is by no means a shy bird, and during last August I saw a single bird on three consecutive week-ends, often at a distance of 10 ya ds. Although found on our marshes, it always frequents fresh water, and as yet I have not seen a bird feeding among salt water.

The Wood Sandpiper, *Totanus glareola*, is only known to have occurred twice on the Solway, both having been got near Skinburness, the first in 1893, the second being got on August 20th, 1898. I saw the last of these two birds in the flesh, but unfortunately it never reached the hands of a taxidermist. It has been obtained in the south of the county at Edenhall.

The Redshank, *Totanus calidris*, is perhaps the best known bird of the marshes, and during the last few years has increased considerably in numbers. Although essentially a bird of the sea-shore and marshes, it is now to be found breeding far inland, frequenting the rough pasture fields and meadows, and keeping company with Dunlins on the mosses and moorland. One might call it a gipsy migrant, as during the winter months nearly all these birds leave both Rockcliffe and Burgh Marshes, and frequent the marshes on the borders of the Wampool and

Waver, where food is more abundant. Towards the end of February birds begin to come back to their old quarters, and by the end of March or beginning of April, some are paired, and looking for suitable nesting ground. A few nests may be found in April, but these are generally destroyed by the high spring tides which prevail at this season. The nest is well concealed in a tuft of grass, but after the bird has sat a short time one can easily see a well defined run to the centre of the tuft. When the nests are approached the birds lose all fear, and fly close over the head of an intruder, making a most deafening noise. Occasionally they sit very close, and once I actually touched a bird sitting upon its nest, mistaking it for a stone.

The Dusky Redshank, *Totanus fuscus*, is known on the Solway as an autumn migrant, and is somewhat irregular in its visits. Young birds, in first autumn dress, occur most frequently, and are called by the wildfowlers "Spotted Redshanks," but occasionally an adult in winter dress is seen.

The Greenshank, *Totanus canescens*, is a fairly common autumn migrant, arriving on the Solway as early as the end of July or beginning of August. The birds arrive in small parties of seven or eight, but break up and may be seen singly or in pairs frequenting certain select places day after day. They are extremely wary birds and difficult to approach; they do not associate with other waders, and feed in the creeks of the marshes in the manner of Redshanks.

The Bar-tailed Godwit, *Limosa lapponica*, is a very common autumn visitor to the Solway, sometimes spending the summer on its estuaries. Large flocks are to be seen in August, some of the old birds still retaining their red breeding dress, but the majority being immature birds in their first autumn. At low tide they sit and feed on the sand banks between the river channels, often in flocks of thousands; I have seen a flock which I estimated at three thousand birds. When the tide is at its height they rest on the higher marshes and pasture land adjoining the frith, but follow the retiring tide, feeding on the dainty bits left in the sand. In June, 1903, I saw a large flock of Bar-tailed Godwits frequenting the River Wampool, and during 1904 a pair spent the summer on the same estuary.

The Black-tailed Godwit, *Limosa belgica*, is very irregular in its visits to the Solway, and I have only seen two examples there. It occasionally occurs in spring and early summer on its northward migration.

The Curlew, *Numenius arquatus*, is the largest of British Waders, and is a common breeding species throughout the county. In autumn large flocks are heard passing over Carlisle on migration, and increase the parties of home-bred birds on the marshes. During July the birds can be seen in small family parties in charge of the old birds, who act as guides, and keep the young out of danger. Curlews are extremely wary, and very difficult to approach. During the flow of flood tide, they leave the shore and sandbanks, and retire to the higher marsh-land and fields, where they rest for a short time. Immediately the first sandbank is exposed on the ebb tide, you may hear a solitary Curlew call, and in a short time birds will be seen coming to the feast which awaits them, not in flocks like most of the waders, but by single birds and pairs, calling all the time, their clear note being heard at a great distance. At this time they are easily shot, if the fowler is hidden well, as they fly low. They generally take the same course day after day, but if much disturbed they grow wary and soon alter their route. The Curlew's alarm note puts every other bird in the vicinity on the alert, and wildfowlers after Geese at night are often disappointed of a shot by them. When suddenly alarmed, the noise they can make is sufficient to scare human beings. Towards the end of March, they begin to visit their intended breeding grounds, but it is not until April or beginning of May that nesting commences. The nest is a depression in the ground scantily lined with grass. It breeds on the mosses, moorlands and meadows, and I have seen the nest in the clearings of a wood. The eggs are four in number, and clutches vary greatly in size, shape and markings. Although a large nest, it is difficult to find, as the sitting bird generally leaves the eggs before you get a sight of her, but at times I have seen a bird leave the nest, run for a distance, and fly quietly away. I once found a nest of this species in a novel way on one of the Cumberland mosses. From the actions of the birds I knew the nest was near and incubation far advanced, but after searching for some time, I decided to give it up; just then I heard a young

one call, I listened for some time, and at last located the sound amongst the heather. Going towards it I was surprised to find not young ones as I thought, but a nest containing four eggs just chipping, the young in the shells calling continually.

The Whimbrel, *Numenius phæopus*, is a spring and autumn migrant, visiting the Solway on its way to and from its breeding grounds in the north. During spring large flocks of Whimbrel pass over Carlisle, and at that time are found resting on the Solway marshes. They are usually seen in small parties, and are easily approached, but when returning south in autumn they are wild and shy. The first or second weeks in May is the usual time of arrival of the spring migrants, but I have seen birds as late as June 3rd. On autumn migration, immature birds in their first year visit us at the end of July or early in August.

## LIMICOLÆ OF CUMBERLAND.

Name.	Resident or Migrant.	Season of Migration or occurrence.
ORDER LIMICOLÆ—FAMILY GLAREOLIDÆ.		
Collared Pratincole, <i>Glareola pratincola</i>	..one occurrence	.. —
Cream-coloured Courser, <i>Cursorius gallicus</i>	,, ,,	.. Autumn
FAM-CHARADRIIDÆ :—		
Dotterel, <i>Eudromias morinellus</i>	..regular migrant	..Spring and Summer
Golden Plover, <i>Charadrius pluri- alis</i>	..resident	.. —
Grey Plover, <i>Squatarola helvetica</i>	..regular migrant	.. Autumn
Ringed Plover, <i>Ægialitis hiaticula</i>	resident ..	.. —
Lapwing, <i>Vanellus cristatus</i>	.. ,,	.. —
Turnstone, <i>Streptilas interpres</i>	..regular migrant	..Spring and Autumn
Oyster Catcher, <i>Hæmatopus ostra- legus</i>	resident ..	.. —

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## LIMICOLÆ OF CUMBERLAND—continued.

Name.	Resident or Migrant.	Season of Migration or occurrence.
Red-necked Phalarope, <i>Phalaropus hyperboreus</i>	..migrant ..	..Autumn.
Grey Phalarope, <i>Phalaropus fulicarius</i>	.. " ..	.. "
Woodcock, <i>Scolopax rusticula</i>	..resident ..	.. —
Great Snipe, <i>Gallinago major</i>	..migrant ..	..Autumn
Common Snipe, <i>Gallinago cælestis</i>	resident ..	.. —
Jack Snipe, <i>Gallinago gallinula</i>	..regular migrant	..Autumn
Red-breasted Snipe, <i>Macrorhamphus griseus</i>	..one occurrence	.. "
*Pectoral Sandpiper, <i>Tringa maculata</i>	.. " "	.. "
Dunlin, <i>Tringa alpina</i>	..resident ..	.. —
Little Stint, <i>Tringa minuta</i>	..regular migrant	..Autumn (Spring rarely)
Temminck's Stint, <i>Tringa temmincki</i>	migrant	..Autumn
Curlew Sandpiper, <i>Tringa subarquata</i>	..regular migrant	..Autumn (Spring rarely)
Purple Sandpiper, <i>Tringa striata</i>	..migrant ..	.. "
Knot, <i>Tringa canutus</i>	..regular migrant	..Autumn and Spring
Ruff, <i>Machetes pugnax</i>	.. " "	..Autumn
Sanderling, <i>Calidris arenaria</i>	.. " "	..Autumn and Spring
Buff-breasted Sandpiper, <i>Tryn- gites rufescens</i>	..one occurrence	..Autumn
Common Sandpiper, <i>Totanus hypoleucus</i>	..regular migrant	..Spring and Summer
Green Sandpiper, <i>Totanus ochropus</i>	.. " "	..Autumn
Wood Sandpiper, <i>Totanus glareola</i>	migrant ..	.. "
Redshank, <i>Totanus calidris</i>	..resident ..	.. —

\* The Pectoral Sandpiper is the only wader which has occurred in Cumberland, but not in the Solway district.

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LIMICOLÆ OF CUMBERLAND—continued.

Name.	Resident or Migrant.	Season of Migration or occurrence.
Spotted Redshank, <i>Totanus fuscus</i>	migrant ..	.. Autumn
Greenshank, <i>Totanus canescens</i>	.. regular migrant	.. .. (Spring rarely)
Bar-tailed Godwit, <i>Limosa lapponica</i>	.. ..	.. Autumn
Black-tailed Godwit, <i>Limosa belgica</i>	.. migrant ..	.. Spring and Autumn
Curlew, <i>Numenius arquata</i>	.. resident ..	.. —
Whimbrel, <i>Numenius phæopus</i>	.. regular migrant	.. Spring (Autumn rarely)

## THE FAUNA OF CUMBERLAND IN RELATION TO ITS PHYSICAL GEOGRAPHY.

BY FRANK H. DAY, F.E.S.

*Read Dec. 9th, 1902.*

The principal influences which affect the fauna of a country are climate and geographical position. Thus a country near the equator produces forms of life both rich and varied in aspect, while another near the frigid zone produces a paucity of animal life usually of lowly and humble form, and between the two extremes we meet with forms of life graduating from one to the other. Climate and geographical position as contributory factors in the evolution of a country's fauna are in a great measure affected by each other; that is to say, the climate of a country depends largely upon its geographical position. These two influences upon fauna and flora may, however, be considered as general ones; but when we come to examine a country's fauna and flora in detail, we find that though they roughly determine its salient features, we must look to that country's physical features to see what it is which more particularly affects and regulates the animal and plant inhabitants within its borders, and as there is the utmost diversity in the physical peculiarities of the various countries in the different zones of temperature, it likewise follows that their flora and fauna vary in like degree. Another influence upon fauna which should not be lost sight of, is the proximity to, or wide separation from, one country and another, for in the case of complete isolation for long periods of time, it must follow, with the acceptance of the theory of evolution, that the innate proneness of all animals to vary, coupled with the lack of infusion of new blood, must in time produce forms of life differing from those of other countries whose limits are not so circumscribed. As a remarkable instance of this phenomenon we need only look at the island of Australia, where we meet with forms of life totally unlike any other region of the world, while Madagascar in a less degree is another case

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in point. There can be little doubt that the isolation of the British Isles from the Continent of Europe has exercised a certain amount of influence upon our fauna, but this is perhaps not so evident as it would have been if the European mammalian fauna had been a richer and more varied one. There is, however, one fact which the isolation of our islands has caused, which must be patent to all, and that is the number of animals which have become extinct within historical times, as compared with the Continent, where their range has not been limited by sea boundaries. In the case of birds whose instincts are migratory, and who possess the means of wandering beyond the confines of our islands and inter-breeding with the birds of other countries, the effect of isolation will have little or no effect, though the red grouse (*Lagopus scoticus*) affords a striking case of what isolation can do. This bird, ornithologists are agreed, is but an insular form of the Willow Grouse of Northern Europe, but as a result of long isolation has developed several traits unknown in the Continental bird.

Having said so much upon the general points bearing upon fauna, it will be well to come nearer home, and look at the relationship of our county's fauna to its physical geography. In a country of the restricted area of Great Britain, there is no great scope for the development of a fauna presenting striking features of divergence among its constituents. A student of the zoology of the Continent of Europe would know roughly what the animal products of any one county of England, Wales, or Scotland would be, from his knowledge of the British fauna as a whole. In other words, one county's fauna has much in common with another county's in a broad sense; but if we look into a county's fauna in detail, and compare it in detail with another county's fauna, we will find much difference between the two. The physical geography of a county as an influence upon the distribution of its fauna, is one of great importance, and the field naturalist of experience knows at once from the nature of the ground what birds or mammals, insects, or mollusca, he is likely to meet with. Thus, if he wants to study the habits of the ring ouzel, he goes to the uplands, if the merlin to the moors, while for the terns and the ring plovers he seeks the shingle beds of the sea shore or tidal estuary. In like manner,

the lepidopterist knows that he will not find the "emperor" moth in meadows or on sand dunes, but on heaths and moors, and if he wants specimens of the "mountain carpet" he must search the stone dykes on the fells. To be sure there are many forms of life which are almost cosmopolitan in their range, and are unaffected by any condition of country. With such as these it is not my purpose to deal in this paper, but only with those whose range and habitat is governed by certain physical conditions.

Situated at the extreme north-west point of England, bordered on the north by Scotland, on the east by the counties of Northumberland and Durham, on the south by Westmorland and Lancashire, and with its western borders open to the sea, the county of Cumberland, eleventh in point of size of the counties of England, embraces within its borders the greatest diversification of physical features one could wish for. Here are the highest mountains in England, and more than half the lakes, while high up on the plateaux connecting mountain with mountain are numerous tarns, the embodiment of solitude. Barren and rugged mountains shelve down to fertile and richly wooded valleys, irrigated by streams of the purest water. Some of the last remaining examples of disappearing species linger here, and may, it is hoped, find the remoteness of their habitats sufficient protection from total extinction.

The eastern borders of the county are occupied by the Pennines, of which Crossfell is the highest point. North of the lake mountains the extensive plain of Cumberland commences, and occupies the major part of the northern half of the county. This is the best cultivated part of the county, but here and there extensive areas of mossland are encountered, and give a home to many birds and insects. These "mosses" are quite a characteristic feature of the county and some, such as Wedholm Flow, Bowness Moss and Bolton Fell, are of considerable extent.

The geology of Cumberland affords an interesting study. New red sandstone and carboniferous limestone are its principal formations, with, in the lake district, large areas of Skiddaw slate and volcanic rocks, and in the west, near Whitehaven, the coal measures crop up. It is not, however, probable that the solid geology of the county has any great bearing upon the distribution

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of its fauna, but rather it is the superficial deposits or surface soils which give us the best index to the animals most likely to occur in different districts. The surface of Cumberland is for the most part covered with glacial drift of varying thickness, while as already mentioned, there are considerable areas of mossland or peat, and along the estuaries of the Eden, Wampool, and Waver, are large stretches of alluvial or river deposit, possessing many features of interest from a faunistic point of view. Along the coast from Bowness to Workington, is a line of blown sand or raised beach, about 25 feet above the present sea level, which to the south of Silloth forms sand dunes. The rivers of the county are numerous, but none are of great length, though the valleys down which they flow leave little to be desired as haunts for birds and insects. They form active agents in the distribution and dispersal of both animal and plant life, and the coleopterist is never surprised at anything he finds in the refuse thrown up by rivers when in flood.

I will now pass on to closer reference to the leading features of the fauna of the three natural county divisions of "mountains," "plain," and "coast."

Nowhere else in England do we meet with such an assemblage of lofty hills as in the lake district of Cumberland, where, grouped together with a fine disregard of order which wild nature at times delights in, we make acquaintance with the noble form of Skiddaw, overlooking High Pike, Carrock and Blencathra on the one side, and on the other, across the placid waters of Bassenthwaite, the regular forms of Grisedale and Causey Pikes. Or if you would have a glimpse of a sterner and more rugged aspect of nature, descend to the plain, and follow the vale of Borrowdale to where Honister Crag hangs nearly perpendicularly over the road, then cross the head of Buttermere and climb the Scarf Gap into Black Sail Pass, and see the precipitous form of the pillar of Ennerdale, rising like a great column far above its attendant heights; then turn to the south, cross the shoulder of Brandreth and so up Great Gable, when right ahead, across Sty Head and Sprinkling Tarns, Scawfell Pike, the crowning glory of the English lake mountains, rears its summit 3,210 feet above sea level, and looks down upon its clustering compeers.

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It would have been expected that in such a wild region we should find forms of life of a striking character, but this is not so, as far as the vertebrata are concerned, for one can tramp for miles over hill and dale, and see little of bird life different from the plains. In times past, the osprey, the peregrine, the sea eagle and probably the golden eagle itself, had eyries among the rocky fastnesses of lakeland, but except for the peregrine, they have long since disappeared. The common buzzard still holds its own, and may at times be seen circling high over the rocky crags, or sweeping across the valleys from one fell to another, while the hoarse croak of the raven may be heard under the jutting edge of some precipice, and the much-sought after dotterel visits certain favoured fells in limited numbers, but is hunted to death for fly dressing. In the world of insects on the other hand, we meet with many species in considerable numbers, nowhere else to be found within the county's confines, and this is especially the case with the coleoptera, such fine species as *Carabus glabratus*, *Pterostichus vitreus*, *Agabus arcticus*, and *Telephorus obscurus* being among the most noteworthy, while among the butterflies, the mountain ringlet (*Erebia cassiope*), the only alpine species found in the British Isles, is to be seen in plenty on and around the grassy slopes of Great Gable. It is a remarkable thing that the British Isles should not have more than this one species of alpine butterfly. On the Continent are found a great many which range up to the snow line on the highest Alps. It may be that our British "mountain ringlet" is the sole survivor of a richer alpine butterfly fauna. We have, however, several characteristic mountain moths in *Larentia cæsiata*, *L. salicata*, *Nemeophila plantaginis*, var. *hospita*, *Crambus furcatellus*, and *C. ericellus*.

The second mountain system of Cumberland stretches along the eastern border of the county. Unlike the lake country, it presents us with little in the way of picturesque scenery. The Pennines are mountains of regular outline, covered with grass and heath to their summits. Except for Tindale and Talkin Tarns, there are no lakes. For this reason, they are seldom visited by excursionists, and consequently a greater privacy is afforded to the wild creatures which inhabit them. The dunlin, absent from the lake mountains as a breeding bird, is to be found nesting

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on Crossfell; and the clear whistle of the golden plover is frequently heard. The ring ouzel too, breeds here more abundantly than in any other part of the county, but the avi-fauna of these fells has perhaps not been so closely studied as elsewhere, and there is probably much of interest still unknown. The lepidoptera seem to be poorly represented, but it is possible that the "mountain ringlet" will be found to occur. On the other hand, the coleopterous fauna of the Pennines presents many features of interest. Crossfell produces many interesting species, especially among the aquatic kinds, but it is a singular fact that ground beetles are decidedly scarce, while on Cumrew fell a little to the north, and in the same mountain system, *Geodephaga* of many good mountain species abound. The explanation is probably this. Crossfell and Cumrew fell are both in the same geological series—the carboniferous or mountain limestone—but Crossfell contains hematite or iron ore, which would appear to be unfavourable to ground beetles, while Cumrew fell has a surface of peaty soil, and as far as I know no iron ore has been found there. The Caldbeck fells, forming the northern limit of the lake mountains, produce very few beetles of any kind, and their mineral wealth is well known. It is the same near Whitehaven, where iron ore is extensively worked, beetles being extremely scarce and of the commonest kinds.

The second faunal area of Cumberland comprises the extensive plain of which Carlisle is about the central point. The physical constitution of this area is eminently favourable to creatures requiring a woodland habitation, for although there are not any very extensive areas of forest land remaining from the ancient and historical forest of Inglewood, there are numerous patches of wood and plantation, generally in the river valleys, which provide birds and insects with a suitable home. Of Inglewood Forest, but the scantiest traces now remain. Three gnarled and weather-worn oaks in Rose Park are probably the only living survivors of one of the most extensive forests in Britain. Inglewood Forest was of triangular shape, and its boundary limits, as defined by the Forest Commissioners in the 29th year of Edward the First's reign, were: "From Carlisle to Westward by Thursby, thence to Caldbeck, Castle Sowerby, Mabil Cross,

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Blencowe and Penrith ; whence its boundary ran along the river Eamont to its confluence with the Eden, which constituted its eastern limit, then northward to Carlisle." This splendid tract of forest country, full of streams and tarns, must have been a paradise for living creatures. At a very early time, it was described as a "goodly great forest, full of wood, red deer and fallows, wild swine, and all manner of wild beasts." "In the year 1300, King Edward I. took up his abode at Rose. It is related in the Chronicle of Lanercost, that he hunted in the Forest of Inglewood, where he took 200 bucks and does." In 1374 Bishop Appleby's register says :—"Several unknown persons have broken into the Bishop's park at Rose, and (with dogs and nets) have killed and carried off great numbers of his deer, and an injunction has been sent out to the neighbouring clergy requiring them to denounce all such offenders." "In 1380, the Scots laid waste to Inglewood Forest, and seized 4,000 cattle."

Most of the tarns within the precincts of the forest have long since disappeared. Chief of these were Tarn Wadling and Cardew Mire. Tarn Wadling was situated between Barrock and Blaze fells, and was a favourite haunt of wild fowl, and the late T. C. Heysham found some good beetles on its margins, the most noteworthy being *Notiophilus rufipes*, which was the first record of this species for the British Isles. This tarn was drained by Lord Lonsdale in 1858, and is now a broad expanse of cultivated ground. Cardew Mire was in the parish of Dalston, near the western border of the forest, and was of considerable size, being  $2\frac{1}{2}$  miles long by  $\frac{1}{4}$  mile broad. It can hardly be described as a tarn or lake, but was more of the character of a swamp, covered with a dense growth of rushes and other aquatic plants. It too was much frequented by wild fowl, and the bittern is said to have bred there. Heysham appears to have been a frequent visitor to Cardew Mire, and judging by the species of coleoptera and lepidoptera recorded by him as taken there, it is evident the place was a sort of field-naturalist's paradise. A railway now runs over the ground, and everything is changed, and many of the old naturalist's rarities have disappeared with the draining.

Although the progress and development of agriculture have not been without their effects upon the fauna of

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the Cumberland plain, there still remains much of interest; an absence of coal pits and mining operations has left the country still free to many of nature's creatures. The formation of this area is for the most part new red sandstone, with a covering of glacial drift, and in places peat. Between Penrith and Carlisle, and in a line with the London Road, the sandstone rises into a series of low hills, in which quarrying is carried on. These hills are Penrith Beacon, Bowscar, Wan fell, Lazonby fell, Blaze fell, and Barrock fell, the last-named being the nearest to Carlisle. The highest of these does not exceed 811 feet. Some of them are covered with heather, and offer a home to many rare and local insects. Wan fell in particular has produced quite a number of interesting insects, more especially beetles, and not a few of these are species usually associated with mountains, as *Miscodera arctica*, *Cymindis vaporariorum*, and *Agabus congener*, while the occurrence there of such maritime species as *Calathus fuscus* and *C. mollis*, invests Wan fell with more than ordinary interest to the coleopterist. It is rather strange that the adjoining Lazonby fell should, so far, have proved singularly devoid of interest from a collecting point of view.

In the plain of Cumberland, and especially in the Eden Valley, are many fine patches of woodland, the descendants of members of Inglewood Forest. Some of these woods are much frequented by the smaller birds for breeding purposes; special mention may be made of the pied flycatcher, which, as a breeding species in the British Isles, probably has its headquarters in the woods of the Cumberland plain. Barron Wood, lying between Lazonby and Armathwaite, is a famous locality for rare insects.

The peat mosses of Cumberland are one of the most characteristic of the county's physical features. These mosses, both to the zoologist and botanist, are of the greatest interest, for they harbour a fauna and flora quite peculiar to themselves. Wet and treacherous bogs though they are, they always repay the field naturalist well for the frequent immersions he is subject to when studying and collecting their treasures. To deal properly with the fauna of our "mosses," would entail more space than can be spared in such a general paper as this, so this part of the subject

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must be skimmed briefly. The butterfly typical of our "mosses" is the marsh ringlet (*C. tiphon*). It is a common insect on most of our moors in June, just at a time when a good many other typical "moss" lepidoptera are in their prime, so that an expedition after *C. tiphon* is sure to be productive of a good haul of other interesting species. A little to the north-west of Penrith lies a "moss," Newton Regny Moss by name, to which special reference must be made, for as a locality for rarities it has surprised all who have collected on it, whether botanist or entomologist or spider-hunter. Compared with other of our county mosses, it is of very limited extent, covering only 30 acres, but within its narrow boundaries 6 species of aquatic plants and 19 spiders occur which have not been found elsewhere in the county. I visited the moss first in September, 1902, in quest of beetles. As a result of a few hours' collecting, 10 species were found new to Cumberland, and each subsequent visit has yielded many others to which the same interest attaches. It is only necessary to mention the names of such rarities of *Pselaphus dresdensis*, *Donacia obscura*, and *Phytobius muricatus*, to show the faunal interest of this moss. Most of our "mosses" lie in the red sandstone series, but Newton Regny Moss is in the carboniferous, and is more of the nature of fenland than a peat moss. Like the now limited extents of fen remaining in East Anglia, it has retained its ancient nature, and as the surrounding country was drained by the improving hand of the agriculturist, the range of the natural denizens was curtailed and restricted, until to-day they are as it were penned up in the last remnant of virgin ground.

The coastline of Cumberland, stretching from the mouth of the Sark in the north to Duddon Sands in the south, is a distance of upwards of 70 miles. From its southern limit to Skinburness, it consists for the most part of raised beach or blown sand. About midway between these points is the rocky red sandstone headland of St. Bees, a favourite bird "corner," and the only breeding station in the county of the herring gull and the cor-morant. Another favourite bird haunt is Ravenglass estuary, where terns of several species nest. The sand hills near Silloth, furnish the entomologist with many species: *Lepidoptera*, *Coleop-*

*tera* and *Hymenoptera* are especially abundant, while near Allonby the occurrence of such a beetle as *Anthicus scoticus* should not be passed by unnoticed.

Beyond Skinburness the coast line deviates to the east, and we encounter the famous tracts of alluvium of the Solway Firth, formed by the Rivers Waver, Wampool, Eden and Esk. It is here that we meet with bird life of the richest and most varied kind. Ducks and geese, gulls and terns, sandpipers and plovers, here congregate at times in immense numbers, following the ebbing tide or dibbling in the ooze beds for the necessities of life. The sheld duck nests in rabbit holes, the redshank on the open marsh, while the oyster catcher favours the shingle beds.

The insects of these marshes are principally beetles. The *Geodephaga*, or ground beetles, are well represented, and on a fine day in spring or early summer, the mudbanks and creek edges are bright with the metallic forms of *Pogonus* and *Bembidium* darting from creek to creek, while *Dyschirius*, slower of movement, seeks for the pellets of sand thrown up by burrowing *Bledius* upon which it preys, and round the edges of briny pools we meet with several small and obscure species of *Octhebius*. Beneath clods, *Tanymecus palliatus* is found, and more sparingly the beautiful *Polydrusus chrysomela*, and from the long grass fringing the creek sides *Telephorus darwinianus* is to be swept. In striking contrast to the abundance of beetle life on these marshes, the lepidopterist will find next to nothing, a remarkable instance of the limitations of this Order of insects with regard to its distribution. The position of Bowness Moss, one of the largest expanses of peat in the county, is peculiar. Sandwiched between the saltings of Moricambe Bay and Drumburgh, it has a narrow strip of blown sand on one corner, and one of glacial drift on the other, and we find its fauna differing in at least one important degree from that of the adjacent marshes, for it possesses a true moss fauna, and the lepidopterist may find plenty for his net to do and abundance of larvæ to be boxed from the ling.

Although, perhaps, somewhat outside the limits of my paper, I should like to say a few words upon the rainfall of Cumberland.

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The rainfall of Cumberland, especially in the mountain regions, is far above the average of the counties of England. The average yearly rainfall of some places in the county is seven times greater than London. At the Sty, in Borrowdale, as much as 165 inches is sometimes registered in one year. How far this excessive rainfall affects our fauna it would be difficult to tell, but on the whole I think it must operate in a favourable direction, for the tarns, lakes and mosses, being constantly supplied with water, must naturally offer a more permanent home to aquatic forms of life than another county with a less copious rainfall, where the drying up of sheets of water is a more probable contingency. All who have studied the birds of the county know that we have a very rich fauna in water-frequenting species, especially among those species which visit the county for the winter. And with breeding species of water fowl too, the county is well represented. The extensive gulleries of Ravenglass, Bowness and Salta, could probably not exist if there was not abundance of water.

The water beetles of the county are a very striking group, no less than 115 species having been found, and it is quite certain that numerous others still await discovery, so that I think it may be safely assumed that the excessive rainfall of Cumberland, in certain respects at least, tends to increase and add variety to the fauna within its confines.

Looking at the fauna of Cumberland in detail, it may be said that our knowledge of it is very full in some groups, while in others it is of the scantiest. The list of mammals runs to 41 species, the reptiles to 4, batrachians to 6, the salt and fresh water fish to exactly 100, while the latest census of birds totals up to 259 species. Of land and fresh water mollusca 93 species are recorded out of 139 known as British. Thanks largely to the exertions of the Rev. F. O. P. Cambridge, 219 species of spiders have been found in Cumberland.

Entomology being in this district such a progressive study, it is at any time difficult to give the numbers of species of the different Orders known to occur, but collectively, the insects of Cumberland are upwards of 2,800 species, of which more than one-half are beetles.

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Although there is still abundance of work left for the field naturalist, it is an undoubted fact that the knowledge of the fauna of Cumberland has of late years increased very considerably, a condition of things for which this Society may take to itself a fair share of credit. With everything in their favour for the furtherance of field study and observation, the naturalists of Cumberland may wander for years in the valleys and mountains before exhausting the fauna of one of the most interesting counties in England.

## GULLS AND DIVING BIRDS OF THE SOLWAY.

By LINNÆUS E. HOPE.

*Read Nov. 21st, 1907.*

For the purpose of this paper, birds of several distinct orders are grouped together as "diving birds," *i.e.*—birds which obtain their food by diving or swimming under water, and having certain superficial resemblances, as in the Cormorants (*Stegnopodes*), and Divers (*Pygopodes*), but no actual relationship. The Petrels (*Tubinares*) may safely be named diving birds, for many petrels are expert divers, and the Shear-waters obtain their food in that manner. Some birds of the order *Herodiones*, Herons, &c., are noticed for want of a better place, and because some of the occurrences are noteworthy. Except in few instances occurrences of rarer species mentioned, are subsequent and supplementary to those published in the "Fauna of Lakeland," 1892, and the Victoria History of Cumberland," 1900 (H. A. Macpherson).

Of the various groups composing the Solway avifauna, the gulls are always most in evidence. A visitor to the Solway at any season could scarcely fail to see one or several species, but in autumn or winter, when the cares of nesting are over, is the time to find them fully represented.

The large stretches of mud-flat and sandbank of the firth form an ideal feeding place, and at ebb-tide they are whitened and spotted for miles by gulls feeding and resting upon them, the flocks consisting of some half-dozen species: herring gulls, lesser black-backs, common and black-headed gulls being the predominating species.

The Great Black-backed Gull, *Larus marinus*, perhaps deserves first mention on account of its large size, and the fact that it is our rarest regular breeding species.

The Wild Birds Protection Act denies this species the smallest measure of protection, and even marks it out for destruction by "exception." Yet the great black-back is not all bad, and even does good service in clearing off decaying animal matter from the shores and estuaries.

It is remarkable that no increase or decrease in numbers is apparent one pair of birds laying claim to a certain area of shore which they diligently patrol to the exclusion of all others of their species.

The great black-back is most carnivorous in his tastes, and no weak or wounded bird or other animal will escape his powerful beak once within range of his keen eye. The sound of a gun will often bring him within view in hope of securing a meal off a wounded or unretrieved bird, his harsh raucous voice proclaiming his presence before he is near enough to be identified by sight.

This large, handsome gull breeds somewhat sparingly with us, there being few places in Cumberland quite suited to his requirements, although his nesting site is varied. In Cumberland the chosen nesting place is the wet peat-moss bordering the Solway, where his huge nest, built of sticks, bents, &c., is placed on a tussock, but a little higher than the surrounding bog, and the three, or sometimes two, handsomely blotched eggs laid therein.

The Lesser Black-backed Gull, *Larus fuscus*, is a closely allied bird, and, with the exception of the somewhat paler colour of the mantle, and yellow instead of flesh-coloured legs, is a smaller edition of *Larus marinus*. The habits of this species are similar to the last, except that it is more gregarious, associating with its fellows and other species when either feeding or resting, and breeding in colonies not only on the Solway mosses, but in the rocks at St. Bees head and the Scottish side of the Solway. Both species of black-backed gulls feed largely upon fish, and the lesser species may often be seen inland fishing in the rivers; it is not an uncommon sight in the summer months to see a lesser black-back plunge into the Eden, near Carlisle, and secure an eel, sometimes being completely immersed during the process.

The lesser black-back also feeds upon mollusca, great heaps of the pretty pink shells of *Tellina tenuis* cast up from the stomach of this bird, can be seen at its roosting places near to their nesting

site. It frequently feeds in the newly-ploughed fields after the manner of the black-headed gull. Both species are great scavengers, and carrion of any kind is greatly relished.

The Black-headed Gull, *Larus ridibundus*, has during the last few years occasioned much controversy regarding its food, it being alleged by fishermen and anglers that it is the cause of diminution in the numbers of salmon and trout ; upon the fry of which it is said to feed largely when these are running to sea in spring. Some farmers also complain of the grain eating propensities of the bird at sowing time, when the oats, if not covered, are soon picked up by the large flocks which visit the fields at this time.

At the request of the Cumberland County Council, Mr. D. Losh Thorpe, M. B. O. U., and myself, undertook to investigate the points of complaint.

It is scarcely necessary to enter into details of this investigation, a report on the matter having been published. We desired first to have the opinions of interested persons (local people and ornithologists of repute), and accordingly formulated a series of questions relating to the food and habits of the bird. The result obtained by these questions was not particularly satisfactory, very few of the respondents having made any practical or scientific research in the matter, and the replies of the local people were most conflicting

We had, however, decided to conduct personally an examination of a large series of the digestive organs of these birds, with a view to definitely determining the nature of their food, and the proportion of birds taking the various kinds, setting aside all previous evidence in our possession, either for or against the species.

The result of this examination (which was carried over thirteen months), during which we examined the contents of one hundred crops and stomachs, the birds being obtained by ourselves or under our supervision, showed *L. ridibundus* not altogether innocent of fish-eating, and guilty of the charge of grain eating ; on the other hand, it showed a large amount of good done by taking injurious insects and their larvæ, such as larvæ of *Tipula* (Daddy Longlegs) and *Agriotes obscurus* (Wire worms) though this was

also somewhat discounted by the indiscriminate manner in which both harmful and beneficial species were taken, the latter including a ground beetle rare in this district, *Carabus granulatus*.

There was little difference in the percentage of birds consuming harmful and beneficial food, and we took no account of birds containing fish sent to us, although from a reliable source.

Nine per cent. of our own birds had partaken of fish, and fourteen per cent. of the whole had fed on oats. Taking the number of birds (25) obtained during the sowing season (April) of 1907, forty-four per cent. (11) had taken grain. Twenty-three per cent. of the birds had fed on beneficial insects, chiefly *Carabidæ* of known carnivorous habits, and forty-one per cent. contained insects injurious to agriculture.

A very large proportion of the birds had partaken of food which we considered neutral as regards either injury or good to either the fishing or farming industry, earthworms figuring largely under this heading.

Earthworms are the favourite diet of many birds, especially of the *Limicolæ*, including such useful and harmless species as the lapwing and golden plover, and if a reduction in the numbers of the black-headed gull should produce an increase in the numbers of lapwings and golden plovers, the exchange would be beneficial.

*Larus ridibundus* has undoubtedly increased enormously in numbers in Cumberland during the past ten years, as those who had knowledge of the gulleries before that time can testify. In 1907 the colony on Bowness Flow numbered at least two thousand pairs of nesting birds, but this number sinks into insignificance when compared with the hordes of birds of the species nesting at Ravenglass. The Moorthwaite colony, as noted by the late Rev. H. A. Macpherson (*Fauna of Lakeland*, p. 422) was founded by four pairs of birds in 1879, and in ten years had increased to one thousand pairs. Such or even greater has been the increase in most of the numerous colonies of this county.

This gull does not appear to have any particular liking to any one kind of site for its nesting place, any site seems suitable either inland or on the coast, where a plentiful supply of food may be obtained near (how varied this food is may be seen from the

Table C, of "a report on the food of the black-headed gull," by Linnæus E. Hope and D. Losh Thorpe, M.B.O.U., which forms an appendix to this paper), and where it may be comparatively free from molestation.

At Bowness Flow the nests are on the peat moss, amongst heather and bent grass, placed on any little elevation above the wet moss, and often crowded close together. Sometimes the nest is quite a bulky structure of sticks, heather, and grass, at other times it is merely a depression in a tuft of grass, or in the peat, with a lining of dead grass.

At Ravenglass the nesting place is quite different; here there are extensive ranges and groups of sand-hills, partly covered by coarse bent grass on the tops and slopes, on some of these every available tuft of grass or other lodgment holds a nest of *L. ridibundus*. Some extent of flat marsh-like land lying between the ranges of sand dunes also held a large number of nests, and a similar site is occupied by a small colony on Rockcliffe Marsh.

At Salta Moss the nests are mostly on patches of peat moss, entirely surrounded by water, or supported on platforms formed by the luxuriant growth of bog bean, and in both cases are almost inaccessible, especially in a wet season.

At Moorthwaite Tarn, which is a very strong colony for its area, the nests are placed on an island in the middle of the tarn, surrounded by water of considerable depth, with a bottom of most treacherous nature. This appears to be a layer of decomposing vegetable matter resting upon the bottom mud, and forming a thick platform, which will even bear the weight of a man for a second or two, but then breaks away like rotten ice.

The eggs of all the *Laridæ* are subject to variation in colour and marking, and also to a smaller extent in form, but none possess this character to a greater extent than the black-headed gull; the ground colour varies from a pale buff to dark brown, through various shades of green, and the markings from light brown to black. Blue eggs often occur, these being generally found after the birds have lost one or two sets of eggs late in the season, but there is a well defined variety at Ravenglass, found in fair numbers, which has the thin end blueish, shading into green or brown towards the thick end.

The Little Gull, *Larus minutus*, is a species allied to the last, though much smaller, and although always a straggler to our area, appears to have visited the Solway much more frequently of late years, that is since 1892, when Mr. Macpherson had not handled a local little gull in the flesh, after which date, however, and before 1896, he obtained four local examples, which are in the Carlisle Museum. It has occurred with tolerable frequency since that time, and the following birds have been sent or reported to me. One seen at Silloth, on October 5th, 1903, by W. Nichol, another was shot on the Eden near Nunwick the same year. Two seen at Silloth on June 1st, 1906; one seen at Leegate, April 29th, 1906, by W. Mann; and one in first feather seen at Silloth, September 3rd, 1907.

All the birds were immature birds, showing young plumage, although some were in their second year as those seen on June 1st and April 29th.

Sabine's Gull, *Xema sabinii*, an arctic gull, which in adult summer dress assumes a black hood, has occurred once on the Solway.

The Glaucous Gull, *Larus glaucus*, which is a large arctic species, almost equalling the great black-back in size, has occurred several times on the Solway.

The Iceland Gull, *Larus leucopterus*, which is, as its name implies, an arctic species (although it does not breed in Iceland), is the smaller of the two white-winged gulls, and bears about the same relative proportion to the glaucous gull as the lesser black-back does to the greater, and in no particular of colour or markings can it be distinguished from the glaucous gull, except by the paler colour of the orbit or ring around the eye.

The only recent occurrence of the Iceland gull in the Solway district, is of one which spent several days, from January 26th to February 14th, 1905, on the Eden, near Carlisle. It was an immature bird in about the second year. It was first seen by Mr. Thorpe, and afterwards by Mr. J. B. Cairns and myself.

The Herring Gull, *Larus argentatus*, is a well-known bird on the Solway, and has breeding stations upon both sides of the Firth. The cliffs at Port Warren, on the Scottish side, provide a home for hundreds of these birds, and on some almost inaccessible pinnacles the nests are perfectly crowded together.

There is also a large colony at St. Bees Head, which is perhaps the only nesting place of the species on the English side of the Solway, though there is a possibility of its having nested on the flows and mosses in company with the lesser black-backed gull. In 1901 the colony of black-backs on Bowness Flow was much larger than during the last two years, and in that year Mr. T. Johnston and I repeatedly saw herring gulls there during the breeding season. The food of this gull is similar to that of the black-backed gull, but it is said to eat much grain in the sowing season. Mr. W. Nichol says he has seen large heaps of the husks of corn cast up by this bird at its nesting site on the Scottish Solway.

The Common Gull, *Larus canus*, does not breed on the English side of the Solway, nor in any part of England. It is, however, a common bird on the Solway in winter, and is with us the greater part of the year. A large flock may often be seen on the Eden at Stanwix, composed of adults and young in various stages of plumage during the winter and spring months. It is very similar in colouration to the herring gull, both species having a pale grey mantle in the adult state. All these gulls of the type genus of *Larus* moult several times before arriving at the adult plumage, and the young are all more or less mottled and barred with brown, which becomes lighter after each successive moult.

The Kittiwake, *Rissa tridactyla*, is another small gull which visits the Solway regularly, and in some numbers during winter. At a distance it can scarcely be distinguished from the common gull, but the latter is a little larger and heavier, and a field naturalist can generally separate them by these characters. In the hand the difference is more pronounced, the legs of the Kittiwake are short, and they and the feet are blackish brown, as against the greenish yellow of the Common gull. There is a mere vestige of a hind toe in the Kittiwake, a feature which is fairly well developed in the Common gull.

In its first autumn and winter, this gull possesses a very characteristic dress, known as the "tarrock" plumage, it is barred on the hind-neck and mottled on the wing coverts with greyish black, and is also occasionally finely barred with that colour on the rump.

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Two species of tern only breed on the Solway, the Common Tern, *Sterna fluvialis*, and the Lesser Tern, *Sterna minuta*, but a third species, the Sandwich tern, *Sterna cantiaca*, breeds in the south-west of Cumberland, beyond the limits of the Solway, where it is rarely if ever seen. I visited Ravenglass in May this year, (1907) and saw the Sandwich tern nesting there, as it has done for many years now, in company with the black-headed gulls. The nests of the terns formed small closely grouped colonies in the midst of a large assemblage of the nests of the gulls, and when disturbed the terns circled around in the air with the gulls, with whom they seemed to be upon the best of terms.

The Common tern, *Sterna fluvialis*, nests at Ravenglass in large numbers, and there is also a fairly large colony on Rockcliffe Marsh, where they often suffer great loss of eggs and young from the over-flowing of the marsh by the high tides.

The Little Tern, *Sterna minuta*, is the smallest, the prettiest and daintiest of the gull tribe. It breeds with us at three stations on the English Solway, and also on the coast further south at Drigg.

The Arctic Tern, *Sterna macrura*, is an occasional winter visitor to the Solway. I have never seen this tern obtained there, but have had several brought to me, which had been picked up inland, either dead or in an exhausted condition.

The Roseate Tern, *Sterna dougalii*, is a very beautiful species, resembling the common tern, but more elegant in form, and has the breast suffused with a rosy blush, which fades rapidly after death. It has occurred once on the Solway.

These five species of typical terns resemble each other greatly, but between the sandwich and lesser tern there is much difference in size as well as in the colours of legs and beak, which are black in the sandwich tern, whereas the legs and feet of the little tern are yellow and the beak black and yellow. The common, roseate and arctic terns are more nearly allied, and it is a matter of some difficulty to separate them at a short distance. In the hand, however, it is seen that the tarsus of the Arctic tern is shorter than that of the common tern, and that the red beak of the latter is tipped with black; the legs and feet of both species are red. Except by its comparatively shorter wings, the roseate

tern differs little from the common species. All five species feed almost entirely on fish, which they may be seen bearing in to their young during the nesting season.

Only one other species of the tern can be included in the Solway list, the Black Tern, *Hydrochelidon nigra*, which occurs almost regularly in autumn, and occasionally in spring. The birds which have been obtained in autumn are without exception the young of the year. In June, 1904, an adult in full summer dress, spent three or four days on the Eden at Etterby, Carlisle; it was seen by Mr. Thorpe and myself every day during its stay. It associated with a flock of swallows and martins, hawking and catching the aquatic flies which swarmed over the river, with the best of the *Hirundinidæ*. Terns of the genus *Hydrochelidon* are known as marsh terns, and do not nest on the sea-shore, but in the extensive bog and fen lands, such as are found in Holland and other parts of the continent. It feeds very largely on insects, but also to some extent on small fishes. It has not bred in England since 1858. The following are our most recent occurrences:—An immature male shot at Rockcliffe Marsh, October 3rd, 1903; adult seen at Carlisle, June, 1904; an immature female, Burgh Marsh, September 15th, 1904; immature bird seen at Sillloth, September 18th, 1905; immature male obtained at Sillloth, October 11th, 1907.

The Skuas are very erratic in their visits to the Solway, but all four British species have occurred at intervals. The Great Skua, *Megalestris catarrhactes*, was first recorded as a visitor to the Solway by T. C. Heysham, in 1833, when an example was captured alive on Rockcliffe Marsh. Since that time we have only two authentic records of its occurrence, one being seen by Mr. W. Nichol in November, 1889, and the same keen observer writes to me on 14th of August of this year (1907): "I saw to-day a great skua, it was harrying some cormorants, and I saw the white part of the wing distinctly. It is the second I have seen in an experience of 30 years' fishing and shooting."\*

The Pomatorhine Skua, *Stercorarius pomatorhinus*, is the largest of the three typical skuas, and has perhaps occurred with more frequency than any of the other species, both adults and immature

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\* Since the above paper was read, Mr. Nichol saw a third Great Skua on the Solway in April, 1908. Like the one obtained by T. C. Heysham it was seen killing a gull. L.E.H.

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birds obtained locally, being in the Carlisle Museum. In some years it visits us in fair numbers, a good many making their appearance in 1898, and in 1906 Mr. W. Nichol saw two near Silloth. On October 19th, and on the 28th of the same month, he saw three. This year (1907) he records, August 30th, three pomatorhine skuas seen near Silloth; September 4th, four pomatorhine skuas seen; September 16th, three seen; October 2nd, three seen; and on October 5th, one pomatorhine skua seen.

Richardson's or the Artic Skua, *Stercorarius crepidatus*, has occurred perhaps less frequently than the last species, although a British breeding bird. I have no recent record.

The Long-tailed or Buffon's skua, *Stercorarius parasiticus*, is perhaps more erratic and occasional than the others, but a remarkable visitation of this species took place in 1891, when Buffon's skuas in various stages of plumage were obtained in many parts of the county. Skuas have been seen in the Solway and reported frequently in recent years, but it is impossible to say whether they were *crepidatus* or *parasiticus*.\*

A bird of too common occurrence on the Solway (from a fisherman's or angler's point of view) is the Common Cormorant, *Phalacrocorax carbo*. There is no breeding place of this species on the English side, but they nest numerously on the cliffs and stacks of the Scottish side, and visit the opposite side regularly.

During the winter months many spend their time on the estuaries of the Cumberland Solway, frequently fishing high up the rivers even beyond Carlisle. Messrs. Thorpe & Dunlop obtained eggs of this species at Balcary when we visited that rocky headland in June, 1906.

The Shag or Green Cormorant, *Phalacrocorax graculus*, has been obtained once or twice locally, but it can scarcely be considered a Solway bird. An immature example was picked up dead at Crosby-on-Eden in January, 1908.

The Gannet, *Sula bassana*, occurs fairly frequently, usually during the autumn months, but one was seen by Mr. W. Nichol, at Silloth, in January, 1894. Mr. R. Mann sent an immature female to me at the Museum on November 12th, 1902; it is in the dark,

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\* During 1908 Mr. W. Nichol saw several Small Skuas which he was able to identify. On May 28th he saw a Richardson's, and on June 10th he identified a fine adult Buffon's. L.E.H.

white-spotted dress of the first autumn ; and Mr. W. Nichol sent me an adult, killed at Silloth, in May, 1906. Seeing that this bird breeds in thousands on Ailsa Crag, it might be expected to visit the Solway more frequently than it does.

Another bird which must be recognised here, a characteristic bird of the Solway, which, although it does not obtain its food by diving is an expert fisher, is the Common Heron, *Ardea cinerea*.

Several colonies of this bird exist in Cumberland, and since the dispersal of the extensive heronry in the " Big " wood at Edenhall (which 10 years ago numbered over 70 pairs) has taken place, the finest is now near the Solway, at Floriston, and numbers near 40 nests, whilst there is also a flourishing colony at Armathwaite on the Eden. Neither of these heronries are mentioned in the Victoria History of Cumberland.

The Purple Heron and Squacco Heron have occurred in Cumberland, but not on the Solway, and the Little Bittern, *Ardetta minuta*, has occurred twice in the district.

The Night Heron, *Nycticorax griseus*, has been recorded five times for the Solway district, and has occurred twice during recent years. An immature male was shot in Cargo Beck in November, 1900 ; and another was found dead on Grinsdale island on December 10th, 1903. Both these birds are in the brown, white-spotted dress of the first autumn, and are included in the Museum collection.

The Common Bittern, *Botaurus stellaris*, occasionally occurs in the district, and two examples are in the Museum, one from Drumburgh, and the other from Gretna. The latest recorded Cumberland example is one killed by a dog on the shores of Derwentwater, on November 29th, 1906.

The Spoon-bill, *Platalea leucorodea*, has occurred and been recorded three or four times in the Solway district, two being obtained in 1859 near Carlisle, one killed on the Cumberland coast just outside the Solway limit is in the Museum. These occurrences were all during the autumn or winter months, but Mr. Peal assures me that a Spoonbill visited the estuary of the Eden near Burgh, in April, 1904. It only stayed one day, but he had ample opportunity of observing it, and clearly identified the species,

The family *Alcidæ* is not very strongly represented on the Solway, but there are several breeding places of both Guillemot, *Uria troile*, and Razorbill, *Alca torda*. Both species breed on the red sandstone cliffs at St. Bees Head, where I saw a fair number when I visited that place on May 23rd of this year. On the Scottish side of the Solway a strong colony of these two species is established at Balcary Head. Mr. Harold Carr, President of this Society, Mr. D. Losh Thorpe, Mr. W. E. B. Dunlop, and myself paid a visit to the Scotch side in May, 1907, to see the nesting birds. It was a day of varied experience, full of interest and episode, and although we did not obtain eggs of either Guillemot or Razorbill, Mr. Thorpe succeeded in reaching a nest and secured a nestling of the latter species. To reach this breeding place of sea birds at Balcary Head in the easiest way, a boat was chartered at Kipford, a pretty little fishing village at the head of Rough Firth, near where Urr Water river empties into the Firth. Sailing down Rough Firth at high tide, past Rough Island, the view was magnificent from the water; we hugged the shore to Auchencairn Bay, passing Hestan Island on the land side, and then took straight across the bay to Balcary Head.

Fortunately the day was fine, and the sea calm, with little or no wind, and we pulled in close under the rocks of the headland and wound along close to the cliff, here and there pulling in to wonderfully beautiful little coves and rocky inlets, some of which would just admit our boat and from which we had to back out, our boat bobbing about like a cork—needless to say that if a wind had arisen it would have been dashed to pieces in a few seconds.

Mr. Thorpe and Mr. Dunlop landed on the face of the cliff at several points, and clambered about it in search of nests, but without much success, most of the nests being placed under high over-hanging ledges.

The tide does not leave the foot of these cliffs, but by the end of our stay low tide was approaching, and on the return journey we found it necessary to pass Hestan Island on the outer side, as it is connected to the mainland by a narrow bar of sand at low tide, although on the south-west side it is edged by low rugged cliffs which the water washes constantly. On drawing near to the island a single Guillemot was seen sitting on the water, which on near approach proved to be the Black Guillemot, *Uria*

*grylle*, in full breeding dress. This auk is of rare occurrence on the Solway, and Mr. Macpherson only records two occurrences on the English side.

The coast of Hestan Island is much broken up, and suited to the nesting habit of this bird, and I only regret that we did not take the trouble to definitely ascertain if the species was nesting there. Mr. Thorpe landed on the island and found the Common Tern nesting numerously. Returning to Rough Firth with the tide running rapidly out, we missed the river channel, and after poking about and making several futile attempts to float our boat, we stranded in mid firth, and had the unique experience of walking ashore across Rough Island, which is not an island at low tide, to Rockcliffe village, and thence a mile or so to the hotel at Kipford, where we had left the motor car.

Brunnich's Guillemot has not occurred on the Solway, but a large example of the Common species, with yellow feet and legs, puzzled me a little, but Mr. Howard Saunders and Mr. Ogilvie-Grant, however, showed that it was *Uria troile*.

The Little Auk, *Mergulus alle*, has occurred frequently as a straggler, and the latest records are one seen at Skinburness by W. Nichol, on November 16th, 1906, and another at Silloth, on August 14th, 1907.

The Puffin, *Fratercula arctica*, is a more frequent straggler, as may be expected of a species breeding in vast numbers as near to us as Ailsa Craig, and probably also, in some instances, on the Scottish Solway.

An adult male, in full breeding dress, was caught alive by Mr. Percival of the Boat House, on Rockcliffe Marsh, in August, 1905. I saw it shortly after it died.

The Great Northern Diver, *Colymbus glacialis*, occurs rarely on the Solway, but is more frequent upon the larger inland waters of Lakeland, especially Lake Windermere.

The Black-throated Diver, *Colymbus arcticus*, has also occurred; one was killed in the Eden at Rickerby in 1888. The only one I have seen in the flesh was obtained on Ulleswater in January, 1891.

The Red-throated Diver, *Colymbus septentrionalis*, is chiefly a spring visitor to the Solway, sometimes in numbers. In April, 1905, Mr. W. Nichol informed me that many were then in the

firth, some of them in full summer dress. On April 11th, 1906, he wrote saying "I saw six Red-throated Divers to-day, near Silloth." It seldom occurs in autumn, but the same good observer saw an example on September 3rd of this year. One was killed early in February, in 1903, by W. Peal.

The Great Crested Grebe, *Podiceps cristatus*, has occurred frequently at various seasons, and in different phases of plumage. One in almost full summer dress was accidentally caught in a "haugh" net in the River Wampool, near Anthorn, in April, 1898. This specimen was acquired for the Museum collection.

The Red-necked Grebe, *Podiceps griseigena*, has occurred once or twice. The Slavonian Grebe, *Podiceps auritis*, and the Eared Grebe, *Podiceps nigricollis*, have occurred occasionally. The Slavonian Grebe more frequently than the others, but I have no recent record of any of these three for the Solway district.\*

The Little Grebe, *Podiceps fluviatilis*, sometimes reaches the waters of the Solway, but it is essentially a fresh water species. I noticed one frequenting the Eden, near the bridge at Carlisle, for several days, in September, 1905; and I also saw one at the same place in September, 1906. Several have been sent to me from the River Esk, one in October, and one in November this year. This species doubtless breeds with us annually, but owing to the site of the nest in the midst of some reed covered pond or ditch, and its shy habits, it is seldom discovered.

The Petrels and Shearwaters cannot be omitted from a list of diving birds, although it is not certain that any of the petrels of the more typical genera obtain their food in that way.

The Storm Petrel, *Procellaria pelagica*, occasionally visits our firth and estuaries, the most recent records being one seen by W. Nichol, near the Silloth lightship, on September 13th, 1905, and another near Skinburness, on November 24th, 1906.

The Fork-tailed or Leache's Petrel, *Oceanodroma leucorhoa*, has occurred in greater numbers, and perhaps on more frequent occasions, small parties sometimes appearing, or an irruption takes place of emaciated and exhausted individuals blown on to our coast after a prolonged spell of wind and storm. The winter

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\*A Red-necked Grebe, an immature bird, was obtained accidentally in a fisherman's net at Anthorn, River Wampool, on July 31st, 1908; and an Eared Grebe, in Winter dress, was shot at Port Carlisle, in November, 1908. L.E.H.

of 1906-7 produced several records, two being picked up dead during the first week of December, 1906; one at Bowness-on-Solway, and another at Annan on the opposite side of the firth, a third was seen up the River Esk, at Longtown, on December 2nd, and three Petrels, probably of this species, were seen at Allonby, on January 1st, 1907.

Wilson's Petrel, *Oceanites oceanicus*, appears to have occurred twice at least, but not recently.

The Manx Shearwater, *Puffinus anglorum*, has been observed very infrequently on the Solway, but occasional individuals have been picked up dead from May to August. The only record of a living bird being seen in the higher reaches of the Solway, is a recent one; Mr. W. Nichol having identified a bird as this species, near Silloth, on May 4th, 1906. The same observer informs me that the Manx Shearwater visits the mouth of the Solway during autumn, and he has frequently seen them during September when fishing near the limits of the Solway.

The Fulmar Petrel, *Fulmarus glacialis*, is a rare visitor to the Solway, but an example of the grey-breasted form, obtained in 1892, is in the Museum collection.

### LIST OF SPECIES.

Name.	Resident or Migrant.	Season of Occurrence.
STEGANOPODES (3):—		
1. Cormorant, <i>Phalacrocorax carbo</i>	Resident	
2. Shag, <i>Phalacrocorax graculus</i>	..Casual Migrant	..Autumn.
3. Gannet, <i>Sula bassana</i>	.. .. " "	..Spring and Summer.
HERODIONES (4):—		
4. Common Heron, <i>Ardea cinerea</i>	..Resident.	
5. Night Heron, <i>Nycticorax griseus</i>	..Casual Migrant	..Autumn and Winter.
6. Bittern, <i>Botaurus stellaris</i>	.. " "	..Winter.
7. Spoonbill, <i>Platulea leucorodia</i>	.. " "	..Winter and Spring.
GAVIÆ (20) FAM LARIDÆ, SUB-FAM STERNINÆ:—		
8. Black Tern, <i>Hydrochelidon nigra</i>	..Casual Migrant	..Autumn and Spring.
9. Sandwich Tern, <i>Sterna cantiaca</i>	Regular Migrant	..Summer.
10. Roseate Tern, <i>Sterna dougalli</i>	..1 Record	.. " "
11. Common Tern, <i>Sterna fluxuatis</i>	Regular Migrant	.. " "
12. Arctic Tern, <i>Sterna macrura</i>	..Casual Migrant	..Autumn.
13. Lesser Tern, <i>Sterna minuta</i>	..Regular Migrant	..Summer.

90 GULLS AND DIVING BIRDS OF THE SOLWAY.

Name.	Resident or Migrant.	Season of Occurrence.
SUB-FAM LARINÆ :—		
14. Sabine's Gull, <i>Xema sabini</i>	.. 1 Record ..	.. Autumn.
15. Little Gull, <i>Larus minutus</i>	.. Casual Migrant	.. Winter and Spring.
16. Black-headed Gull, <i>Larus ridibundus</i>	.. Resident.	
17. Common Gull, <i>Larus canus</i>	.. Regular Migrant	.. Winter.
18. Herring Gull, <i>Larus argentatus</i>	.. Resident.	
19. Lesser Black-backed Gull, <i>Larus fuscus</i>	.. "	
20. Great Black-backed Gull, <i>Larus marinus</i>	.. "	
21. Glaucous Gull, <i>Larus glaucus</i>	.. Casual Migrant	.. Winter.
22. Iceland Gull, <i>Larus leucopterus</i>	.. " "	.. "
23. Kittiwake, <i>Rissa tridactyla</i>	.. Regular Migrant	.. "
SUB-FAM STERCORARIINÆ :—		
24. Great Skua, <i>Megalestris catarrhactes</i>	.. Casual Migrant	.. Spring and Autumn.
25. Pomatorhine Skua, <i>Stercorarius pomatorhinus</i>	.. " "	.. Autumn and Winter.
26. Richardson's Skua, <i>Stercorarius crepidatus</i>	.. " "	.. All Seasons.
27. Buffon's Skua, <i>Stercorarius parasiticus</i>	.. " " "	.. " " "
ALCÆ (5) :—		
28. Razorbill, <i>Alca torda</i>	.. Resident	
29. Guillemot, <i>Uria troile</i>	.. " "	
30. Black Guillemot, <i>Uria gryllæ</i>	.. Casual Migrant	.. Summer and Autumn.
31. Little Auk, <i>Mergulus alle</i>	.. " "	.. Autumn and Winter.
32. Puffin, <i>Fratercula arctica</i>	.. " "	.. Summer and Winter.
PYGOPODES (8) :—		
33. Great Northern Diver, <i>Colymbus glacialis</i>	Casual Migrant	.. Winter.
34. Black-throated Diver, <i>Colymbus arcticus</i>	.. " "	.. Winter
35. Red-throated Diver, <i>Colymbus septentrionalis</i>	.. Regular Migrant	.. Spring and Autumn.
36. Great Crested Grebe, <i>Podiceps cristatus</i>	Casual Migrant	.. All Seasons.
37. Red-necked Grebe, <i>Podiceps griseigena</i>	.. " "	.. Winter.
38. Slavonian Grebe, <i>Podiceps auritus</i>	.. " "	.. Winter and Spring.
39. Eared Grebe, <i>Podiceps collis</i>	.. " "	.. Winter.
40. Little Grebe, <i>Podiceps fluitans</i>	.. Resident.	

Name.	Resident or Migrant.	Season of Occurrence.
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## TUBINARES (5) :—

- |  |                   |                       |
|--|-------------------|-----------------------|
| 41. Storm Petrel, <i>Procellaria pelagica</i>    | .. Casual Migrant | .. Winter.            |
| 42. Leaches Petrel, <i>Oceanodroma leucorhoa</i> | .. " "            | .. " "                |
| 43. Wilson's Petrel, <i>Oceanites oceanicus</i>  | .. Two Records    | .. "                  |
| 44. Manx Shearwater, <i>Puffinus anglorum</i>    | .. Casual Migrant | .. Spring.            |
| 45. Fulmar Petrel, <i>Fulmarus glacialis</i>     | .. " "            | .. Autumn and Spring. |

## 45 Species enumerated :—

- 9 Resident.  
 3 Regular Summer Migrants.  
 2 Regular Winter Migrants.  
 1 Regular Spring Migrant.  
 30 Casual Migrants.

### Analysis of contents of Digestive Organs of 100 Black-headed Gulls Examined by D. L. Thorpe, M.B.O.U., and Linnæus E. Hope.

No.	Date.	Place.	Contents of Stomach and Gullet.
	1906.		
1	May 7th	Glasson	Oats (4 or 5 grains), some finely tritulated vegetable matter and fibres, 2 beneficial beetles, <i>Amara trivialis</i> and <i>A. communis</i> , and 1 harmful species <i>Barynotus obscurus</i> (a weevil).
2	"	Kirkbride	Wireworms (7), 1 harmful beetle, <i>Agriotes obscurus</i> (skip-jack), 7 earthworms, and 1 beneficial beetle, <i>Oxytelus rugosus</i> .
3	June, 13th	Moorthwaite	Wireworms (20) and earthworms (18).
4	"	"	Wireworms (2), earthworms (2), and a quantity of portions of beetles, species undeterminable
5	"	"	Husks of oats, and other vegetable matter, wireworms (4), earthworms (3), 1 harmful beetle, <i>Athous hæmorrhoidalis</i> (skip-jack), and 1 <i>Lathrobium fulripenne</i> (harmless).
6	"	Salta Moss	Wireworms (2), 1 harmful beetle, <i>Agriotes obscurus</i> (skip-jack), and a little vegetable matter.
7	Dec. 10th	Burgh	A mass of earthworms (about 20), and some grit.
8	"	"	Earthworms (about 12), and a little grit.
9	Dec. 12th	Silloth	Earthworms (6), wireworms (2), and some grit.

## 92 GULLS AND DIVING BIRDS OF THE SOLWAY.

No.	Date.	Place.	Contents of Stomach and Gullet.
1907.			
10	Dec. 15th	„	Wireworms (4), earthworms (4), 4 larvæ of <i>Tipula</i> sp. (daddy-long-legs), 1 harmful beetle, <i>Agriotes obscurus</i> (skip-jack), and 1 beneficial beetle, <i>Amara apricaria</i> .
11	„	„	Wireworms (12), earthworms (4) larva of <i>Tipula</i> (crane-fly), 2 beneficial beetles, <i>Amara apricaria</i> and <i>Bembidium littoralis</i> .
12	Dec. 21st	On Eden, nr. Burgh	A small quantity of fish bones, and some hair from a small mammal, probably carrion.
13	„	R. Eden, nr. Burgh	Traces of fish (small bones).
14	Jan. 5th	R. Eden	Earthworms (20), wireworms (2), 2 larvæ of <i>Tipula</i> (crane-fly), 1 larva of a beneficial beetle ( <i>Carabus</i> sp.), and a little vegetable matter.
15	Jan. 9th	Solway, nr. Gretna	Vegetable fibres and grass seed, which may have adhered to other food, and a little grit.
16	Jan. 17th	Solway, nr. Drumburgh	A mass of small crustaceans (about 50), sand hoppers, <i>Talitrus locusta</i> , and 1 small fish about 3½ inches long (fry of herring).
17	„	„	A mass of fish bones intermixed with grit, the vertebræ of 5 herring fry with flesh still adhering; gullet contained 4 partly digested fish of the same species.
18	Jan. 26th	R. Eden, nr. Burgh	Carrion, strips of muscular and epidermal tissue from a dead mammal, probably a dog.
19	„	„	Carrion, from the viscera of a mammal, probably same as 18.
20	Feb. 2nd	R. Eden	A little vegetable matter (turnip).
21	Feb. 15th	Solway, nr. Gretna	A small quantity of vegetable matter and some of husks of grain.
22	Feb. 23rd	Burgh	Vegetable fibres and a small quantity of carrion.
23	April 18th	Glasson	Oats (about 100 grains), 1 wireworm, 1 larva of a moth, 2 earthworms, 3 harmful beetles, <i>Agriotes obscurus</i> , and 2 beneficial beetles, <i>Pterostichus versicolor</i> and <i>Pterostichus strenuus</i> .

# GULLS AND DIVING BIRDS OF THE SOLWAY. 93

No.	Date.	Place.	Contents of Stomach and Gullet.
24	April 22nd	Glasson	A mass of earthworms (about 12), wireworms (12), 2 beneficial beetles. <i>Carabus sp.</i> and <i>Nebria brevicollis</i> , 1 larva of a beneficial beetle, <i>Carabus sp.</i>
25	"	"	Earthworms (20), 1 larva of <i>Tipula sp.</i> (crane-fly).
26	"	"	Earthworms (24), wireworms (15), and 1 larva of a <i>Carabus</i> beetle (beneficial).
27	"	"	Wireworms (6), and some grit.
28	"	"	A quantity of vegetable fibre.
29	"	"	Husks of oats (few), and some quartz grit, size of peas.
30	"	"	Mass of husks and a few grains of oats, earthworms (20), and 1 wireworm.
31	"	"	Husks of oats.
32	April 23rd	Grinsdale	Husks and a few (10) pickles of oats, 1 wireworm.
33	"	Drumburgh	Mass of vegetable fibres and 1 earthworm.
34	"	Glasson	A mass of husks and grains (96) of oats.
35	"	Bowness-on-Solway	Oats (36 grains), 20 earthworms, 1 wireworm, 1 wireworm beetle, <i>Agriotes obscurus</i> , 1 beneficial beetle, <i>Amara apricaria</i> , and ova of earthworms.
36	"	"	Oats (10 grains), 2 earthworms, 1 wireworm, 1 beneficial beetle, <i>Bembidium littorale</i> .
37	"	"	Husks and grains (30 about) of oats, some shells of young molluscs of <i>Tellina sp.</i> and <i>Cardium edule</i> .
38	"	"	Mass of vegetable fibre, 1 wireworm, 1 earthworm.
39	"	"	Earthworms (24), wireworms (6), and 2 larvæ of <i>Tipula sp.</i> (crane-fly).
40	"	"	Vegetable fibres (roots, &c.)

# 94 GULLS AND DIVING BIRDS OF THE SOLWAY.

No.	Date.	Place.	Contents of Stomach and Gullet.
	1907.		
41	April 23rd	Bowness-on-Solway	Oats (9 grains), earthworms (4), wireworms (4), 1 destructive beetle, <i>Agriotes obscurus</i> (wireworm), 2 larvæ of beneficial beetles <i>Carabus</i> sp.
42	"	"	Vegetable fibres, fragments of limbs and elytra of beetles, and shells of small mollusca.
43	"	"	Oats (50 grains) and husks of same, 1 wireworm, and 1 larva of a <i>Carabus</i> beetle (beneficial).
44	"	"	Earthworms (20), wireworms (50), 1 wireworm beetle, <i>Agriotes obscurus</i> , 5 beneficial beetles, <i>Carabus granulatus</i> (1) and <i>Harpalus ruficornis</i> (4), 4 larvæ of <i>Hepialis humuli</i> (ghost moth) and 1 spider.
45	"	"	Earthworms (20).
46	"	"	Vegetable fibre and grit.
47	"	"	Vegetable fibres and fragments elytra of beetles.
48	May 2nd	Moorthwaite	Earthworms (4), vegetable fibres and grass.
49	"	"	Vegetable fibres.
50	"	"	Vegetable fibre, soft shoot of a shrub (birch or willow), and some grit.
51	"	"	Grit.
52	"	"	Vegetable fibres and grit.
53	"	"	Part of a pupa case of a fly ( <i>Diptera</i> ), and some grit.
54	May 9th	R Eden	A pellet composed of finely triturated parts of insects.
55	"	"	Vegetable fibre, a pellet of triturated insects, and two or three aquatic flies ( <i>Ephemera</i> ).
56	"	"	Insects (50), immature grasshoppers or field crickets, and one or two aquatic flies ( <i>Ephemera</i> ).
57	"	"	Insects (finely triturated flies).

No.	Date.	Place.	Contents of Stomach and Gullet.
	1907		
58	May 9th	R. Eden	Vegetable fibres and parts of flies.
59	"	"	Two or three fish bones and some scales from small fry (much digested), vegetable fibres, and grit.
60	"	"	Earthworms (2), vegetable fibres and grit.
61	"	Rockcliffe Marsh	A pellet of triturated insects (flies and beetles).
62	"	"	Earthworms (4).
63	"	"	Parts of ground beetles ( <i>Carabidae</i> ).
64	"	"	Beetles (finely triturated).
65	"	Silloth	Earthworms (6).
66	May 17th	"	Fragments of <i>Carabus</i> beetles, vegetable fibre and grit.
67	May 23rd	Ravenglass	Earthworms (18), wireworms (8).
68	"	"	Earthworms (6), wireworms (2), larva of <i>Tipula</i> sp. (2), wireworm beetles, <i>Agriotes obscurus</i> (4), <i>Cryptophagus riparius</i> (1), 1 larva of a moth, <i>Xylophasia rurca</i> , 1 ground beetle, <i>Pterostichus madidus</i> .
69	"	"	Earthworms (6), wireworms (7), larvæ of <i>Tipula</i> sp. (7).
70	"	"	1 larva of a <i>Carabus</i> beetle, some grass and fibres.
71	"	"	1 wireworm beetle, <i>Agriotes obscurus</i> , 1 larva of <i>Carabus</i> beetle, some grass and fibres.
72	"	"	Wireworms (6), wireworm beetles <i>Agriotes obscurus</i> (2), larvæ of <i>Tipula</i> sp. (cranefly) (12), 2 ground beetles, <i>Nebria brevicollis</i> and <i>Carabus granulatus</i> .
73	"	"	Larvæ of <i>Tipula</i> sp. (10), wireworms (2), 1 earthworm, and 2 ground beetles, <i>Nebria brevicollis</i> and <i>Bembidium littorale</i> .
74	"	"	Fragments of beetles and vegetable fibres.

## 96 GULLS AND DIVING BIRDS OF THE SOLWAY.

No.	Date.	Place.	Contents of Stomach and Gullet.
	1907		
75	May 23rd	Ravenglass	Larvæ of <i>Tipula</i> sp. (3), 1 earthworm, and 22 Dipterous flies, <i>Scatophaga stercorarius</i> (common dung fly), wireworms (2), fragments of beetles, and vegetable fibres.
76	"	"	Wireworms (2), fragments of beetles, and vegetable fibres.
77	"	"	Parts of a dor beetle and vegetable fibres.
78	"	"	Four larvæ of <i>Tipula</i> sp.
79	"	"	Wireworms (9), wireworm beetles, <i>Agriotes obscurus</i> (3), 1 dung beetle, <i>Aphodius finetarius</i> , 2 ground beetles, <i>Nebria brevicollis</i> , 1 larva of a <i>Carabus</i> beetle, 1 larva of <i>Tipula</i> sp., and 3 earthworms.
80	"	"	Larvæ of <i>Tipula</i> sp. (14), earthworms (6).
81	"	"	2 earthworms.
82	"	"	Slugs, <i>Limax agrestis</i> (30).
83	"	"	Earthworms (8), 1 wireworm beetle, <i>Agriotes obscurus</i> .
84	"	"	Earthworms (3), 1 wireworm, 1 larva of <i>Tipula</i> sp.
85	"	"	Earthworms (2), 1 larva of <i>Tipula</i> sp., 16 Dipterous flies, <i>Scatophaga stercorarius</i> , and some vegetable fibre.
86	"	"	Beetle fragments and vegetable fibres.
87	May 30th	R. Eden Carlisle	Fragments of earthworms and beetles.
88	"	"	Insects (aquatic flies, &c.) finely triturated and some small fish bones and scales.
89	"	"	Wireworms (4), parts of beetles.
90	"	"	Fragments of aquatic flies.
91	"	"	Fry of eel (6), <i>Anguilla vulgaris</i> , about two inches in length.
92	"	"	1 eel fry, parts of beetles and vegetable fibres.

## GULLS AND DIVING BIRDS OF THE SOLWAY. 97

No.	Date.	Place.	Contents of Stomach and Gullet.
	1907.		
93	May 30th	R. Eden, Carlisle	Eel fry and shrimps partly digested.
94	May 31st	Silloth	Crustacea (shrimp), <i>Crangon vulgaris</i> , in various stages of digestion.
95	June 4th	R. Eden, nr. Carlisle	Earthworms (6), parts of a beetle, and vegetable fibres.
96	"	"	Wireworms (12), 2 ground beetles, <i>Carabus</i> sp.
97	"	"	Earthworms (3), some vegetable fibre and grit.
98	June 5th	Silloth	Portions of a shrimp. <i>Crangon vulgaris</i> .
99	June 7th	R. Eden, nr. Carlisle	Wireworms (10), earthworms (6), 1 nestling bird, family <i>Passeres</i> , piece of cooked fat meat, and a quantity of bread and 5 ground beetles, <i>Nebria brevicollis</i> .
100	"	"	Aquatic flies ( <i>Ephemera</i> ), &c. (40), small piece of fat (probably taken floating on the surface of the water), and a quantity of bread.

# THE BUTTERFLIES OF CUMBERLAND.

BY GEORGE B. ROUTLEDGE, F.E.S.

(Read Dec. 6th, 1897.)

(Revised, Nov. 5th, 1908.)

In drawing up the following notes on the Butterflies of Cumberland, it has been my aim to bring together all the records of interest I could find in the Entomological Magazines and elsewhere. I have also drawn upon the notes upon the subject by George Dawson, published in the Transactions of the Cumberland and Westmorland Association for the advancement of Literature and Science, and upon F. H. Day's article in the Victoria History of the County, published in 1900. Other sources of information will be found mentioned in the text. I have also received records from various collectors, and, in addition, have added the results of my own observations in the east of the County, extending over a period of 31 years.

In the list will be found the names of 43 species, exclusive of doubtful natives, which may be taken as a very fair total in view of the geographical position of Cumberland. From the known distribution of the remaining British species, it is improbable that many more will be found with us, although *E. æthiops* (*blandina*), one of our doubtfuls, is almost certain to be found sooner or later, as it occurs freely in the counties on our northern, eastern, and southern borders.

A good deal of work, however, might be done in extending the lists of localities. Most of our collectors have been content to follow in the steps of their predecessors, and collect over already well-known ground, few indeed extending their researches into new districts. From this fact there is much repetition in the names of localities, but in dealing with the different species, I have endeavoured to avoid repetition as far as possible.

**Pieris brassicae**, L. (Large White). Generally common in the County. It is a well-known migrant, large numbers having been seen crossing the North Sea and English Channel. In some years it is very scarce in Great Britain; in other years the larvæ become a great plague, destroying the whole crops of winter varieties of cabbage. However, it nearly always happens that a minute parasite, *Apanteles glomeratus*, has multiplied in even greater proportion, and a vast majority of the caterpillars, after spinning up, produce a cluster of yellow cocoons instead of the chrysalis. And in this way the species is kept in check.

**Pieris rapae**, L. (Small White). Generally common in gardens.

**Pieris napi**, L. (Green-veined White). Commoner than *P. rapae* in the County, and more frequently found in marshes, lanes, and woods.

**Euchloe cardamines**, L. (Orange-Tip). Common in the Carlisle and Brampton districts. At Keswick it is reported as not very plentiful (H. A. Beadle, Ento. Record, Vol. vi., p. 277). Scarce about Whitehaven (Jas. Murray). The eggs and larvæ are to be found on *Cardamine pratensis* (cuckoo flower), and *Hesperis matronalis* (garden rocket), the caterpillars feeding on the seed pods.

**Leptidia (Leucophasia) sinapis**, L. (Wood White). Now very rare and local. In Newman's British Butterflies, p. 155, J. B. Hodgkinson writes: "Very rare; only occasional specimens have been taken at Barron Wood and Newbiggin Wood, and have heard that it is more frequent about Ullswater, in the Lake district." Barron Wood, in May and latter end of August (T. Armstrong, Ento. Weekly Intelligencer, vol. vii., p. 29). Rare and very local, has been taken in the Great Wood at Keswick (H. A. Beadle, Ento. Record, vol. vi., p. 277). G. Dawson, in the Cumberland Association Transactions, part iv., 1878-79, records it as having been taken in a wood (since cut down) at Orton, about the middle of May. Two specimens were taken in Orton Wood about 1887 by T. Gilbertson.

It is recorded from North Lancashire and Westmorland; it does not seem to have occurred in Scotland.

**Colias edusa**, F. (Clouded Yellow). This species is of very irregular appearance in England; in some years hardly one is seen even on the south coast, in other years large numbers come from the Continent in May or June, and these produce the specimens that appear in the autumn. Of this species, J. B. Hodgkinson writes: "West Coast of Cumberland, but those only during the past two or three years; only three specimens having been seen for 50 years in Cumberland (T. C. Heysham's authority), (Ento. Weekly Intelligencer, 1859, vol. vii., p. 102). G. Dawson took two specimens in August, 1877, one at Bellevue and the other at Sandsfield, and one in July, 1878, at Little Orton. Common at the end of June, 1877, at Workington (A. Thornley, Ento. Mo. Mag., vol. xiv., p. 64). One was taken at Rockcliffe in 1892, now in Michael Dixon's collection. Two were taken in 1900 near Maryport, and one was seen near Carlisle (F. H. Day). Kirkbampton, October 13th, 1908 (M. Dixon, Ento. xli., p. 309).

**Colias hyale**, L. (Pale Clouded Yellow). This species is also of irregular appearance in England. Our Cumberland records are very doubtful. J. B. Hodgkinson in "Newman's British Butterflies," p. 142, says: "Newbiggin Wood: my father missed one in the large field going into the wood." And also in the Ento. Weekly Intelligencer of 1859, vol. vii., p. 102, he writes: "My father had an odd specimen under his hat near Carlisle last year; he knows *hyale* well, and I could not persuade him to think it was *edusa*." One battered specimen taken at Workington, June 30th, 1877 (A. Thornley, Ento. Mo. Mag. xiv., p. 64).

**Gonepteryx rhamni**, L. (Brimstone). J. B. Hodgkinson, in the Ento. Weekly Intelligencer of 1859, vol. vii., p. 102, writes that he never knew any to be taken near Carlisle nor yet in the County. G. Dawson took one in the lane leading from the low Wigton Road to Little Orton, which was much worn, and he sent it alive to E. Newman, who stated that it was the first that he had heard of from Cumberland. In the Keswick district it was common in the autumn of 1871 (W. C. Marshall, Ento., vol. vi., p. 60). Frequently taken (G. Mawson), and rather rare (H. A. Beadle, Ento. Record,

vol. vi., p. 277). There have been no records of its capture in the county for many years.

The food plant of the caterpillar is *Rhamnus frangula* or *Rhamnus catharticus*. Its distribution in England is entirely governed by that of its food plants.

**Brenthis (Argynnis) selene**, Schiff. (Small Pearl-bordered Fritillary). Common in the County. Abundant in Barron Wood, and in many other localities (J. B. Hodgkinson, Newman's British Butterflies, p. 38). Common at Orton, Newby Cross, and Newbiggin Woods, one fine variety was taken at Orton, which, instead of being a rich brown, is of a dingy white colour (G. Dawson). Also taken at Orton, Newby Cross, Burgh, and Durdar (F. H. Day). Hayton Moss and Gelt Wood (G. B. Routledge). Kirkbampton (M. Dixon). Barron Wood and the lower slopes of Wan Fell (H. Britten). Common locally at Keswick (H. A. Beadle, Ento. Record, vol. vi., p. 277). Plentiful in Scale Hill Woods (G. Mawson).

**Brenthis (Argynnis) euphrosyne**, L. (Pearl-bordered Fritillary). Occasionally taken at Orton, Newby, and Gelt Wood (F. H. Day). One taken in the garden at Stone House, Hayton, July 5th, 1889; common at Barron Wood, June, 1904 (G. B. Routledge). Wan Fell and Barron Wood (H. Britten). Common locally at Keswick (H. A. Beadle, Ento. Record, vol. vi., p. 277). Plentiful in Scale Hill Woods (G. Mawson).

**Argynnis aglaia**, L. (Dark-Green Fritillary). Local. Barron Wood, near Armathwaite, and throughout the Lake district (J. B. Hodgkinson, Newman's British Butterflies, p. 28). Whitehaven district, common at Seascale (Jas. Murray). Keswick district, common on the fells near woods (H. A. Beadle, Ento. Record, vi., p. 277). Common at Silloth, Orton, Newby Cross, and Newbiggin (G. Dawson). Fairly common on the sandhills at Silloth, and abundant at Newby Cross (F. H. Day), Seathwaite, near Borrowdale (J. A. Malcolm). Two specimens near Hayton Moss in July, 1898 (G. B. Routledge). Kirkbampton (M. Dixon). Not uncommon on the slopes of Lazonby Fell (H. Britten).

**Argynnis adippe**, L. (High Brown Fritillary). Very rare in the County. A single specimen taken in Newbiggin Wood, near Carlisle (J. B. Hodgkinson, Newman's British Butterflies,

p. 32), probably the same insect recorded by Hodgkinson as having been taken in 1834 (Ento. Weekly Intelligencer, 1859, vii., p. 103). Keswick district, very rare (H. A. Beadle, Ento. Record vi., p. 277). Scale Hill Woods (G. Mawson). This Butterfly is found at Grange and Silverdale, in North Lancashire, and near Lake Windermere in Westmorland.

**Dryas (Argynnis) paphia**, L. (Silver Washed Fritillary). Very rare in the County. Only some two or three taken in Cumberland (J. B. Hodgkinson, Ento. Weekly Intelligencer, vii., p. 103). Scale Hill Woods, rather scarce (G. Mawson).

**Melitaea aurinia**, Staud. Cat. (Greasy Fritillary). A very local insect, and gregarious in all its stages. Chiefly found in damp meadows and wastes of a marshy character. The larvæ hatch from the egg in July, and towards the end of August they construct silken webs and settle down for hybernation, which lasts until March or April. Their chief food-plant is the Devil's Bit Scabious (*Scabiosa succisa*), although in confinement they will feed on Honeysuckle. J. B. Hodgkinson records *M. aurinia* as very abundant near Carlisle (Ento. Weekly Intelligencer, vii., p. 103), and also records it as occurring at Orton Moss, Newby Cross, and abundant at Brick House, Sebergham; the last named locality produces very small dark specimens, and also some beautiful varieties with large canary-coloured spots on the forewings (Newman's British Butterflies, p. 42). Some specimens taken at Orton and Newby Cross show large straw coloured spots, two of which, on the inner margin, sometimes coalescing. Some are quite destitute of yellow markings, black and red only being the colours, whilst other specimens have three-parts of the wings from the base almost entirely black. The specimens vary considerably in size. Also occurs at Kirkbampton and Burgh (M. Dixon). Wan Fell (H. Britten). At Keswick it used to be common in a field on the west side of Derwentwater, and several specimens were taken by W. Greenip (H. A. Beadle, Ento. Record, vi., p. 277). Maryport (Swainson).

**Polygonia (Vanessa) c-album**, L. (The Comma). Very rare in the County; there have been no captures recorded for many years. J. B. Hodgkinson records in the Zoologist, 1845, p. 1005, the

capture of a specimen at Carlisle, on April 10th, 1835, the first specimen known to have been taken in Cumberland; also in the *Entomologist*, xxvii., p. 22, as having been taken in some numbers at Barron Wood in 1846; also in *Ent. Weekly Intelligencer*, vii., p. 103, as having occurred very freely at that locality where the pupæ were found hanging to the Devils Bit Scabious. T. Armstrong, in vol. vii., p. 29, of the last-named magazine, says that it is often taken in September flying about the hazel. Lake district and Carlisle (*Stainton's Manual*).

**Eugonia (*Vanessa*) polychloros**, L. (Large Tortoise-shell). Very rare. One or two taken at Green Row, on the Solway coast (J. B. Hodgkinson, *Ento. Weekly Intelligencer*, vii., p. 103). Also recorded from Cumberland in Newman's *British Butterflies*, p. 57, and C.G. Barrett's *Brit. Lepidoptera*, vol. i., p. 131. A rare visitor appearing only at uncertain times at Keswick (H. A. Beadle, *Ento. Record*, vi., p. 277). This butterfly is fairly common in the Midlands, as far as Northamptonshire and Warwickshire, but the records for Lancashire, Durham, and Northumberland are few.

**Aglais (*Vanessa*) urticae**, L. (Small Tortoise-shell). Generally common in most years. In the Keswick district Beadle records that he took a few caterpillars at Ashniss Bridge, which produced small imagines in which the red was replaced by a pinkish colour (*Ento. Record*, vi., p. 277).

***Vanessa io***, L. (Peacock). At one time abundant in the county, but it is now become very scarce. In the Brampton district I have only seen about a dozen specimens in 30 years (G. B. Routledge). At Keswick it is recorded as moderately common (H. A. Beadle, *Ento. Record*, vi., p. 277). In the neighbouring counties of Durham and Northumberland, it was fairly abundant some forty years ago, but it seems to be of very rare occurrence now.

***Eu Vanessa* (*Vanessa*) antiopa**, L. (Camberwell Beauty). Another of our immigrants, and no certainty can be placed on its appearance in Britain, it is usually very rare, but occasionally large numbers appear for a few weeks and then die out, whilst it is not observed again for many years. The years in which it has been recorded as most abundant are 1789,

1793, 1846, 1872 and 1880, when it appeared all over the British Isles. G. Dawson took a female at Orton, on April 21st, 1873, and there is also another in the collection of J. W. Harris, of Derwent Bank, Broughton, who captured it near his house on the slopes of the railway (Cumberland Association's Transactions, 1878-79). The specimen taken by G. Dawson, at Orton, is also recorded in the Ento., vi., p. 386. J. B. Hodgkinson also records that T. C. Heysham saw this species near Carlisle some forty years ago. (Ento. Weekly Intelligencer, 1859, vii., p. 103). One taken near Wood Hall, Cockermouth (G. Mawson).

**Pyrameis (Vanessa) atalanta**, L. (Red Admiral). Generally common in some years, in other years it is scarcely ever seen in the county.

**Pyrameis (Vanessa) cardui**, L. (Painted Lady). This is another of our migratory species in England; it generally appears in this country in May and June after migration from Southern Europe or North Africa. The progeny of these specimens appear in such seasons in large numbers in August and September. The natural habit of this species is to go on reproducing its kind throughout the year, and those that arrive in this country endeavour to do this, but eventually the species dies out. It was at one time supposed that this insect hybernated in the imago state, but there appears to be no evidence to support that view. This butterfly has been taken fairly frequently all over the county.

**Melampias (Erebia) epiphron**, Knoch. (Small Mountain Ringlet). Local. This is one of our most interesting species in England; it is only found in the Lake District, but it occurs in several localities in Scotland, and it was taken in some numbers in Ireland by E. Birchall, on Croagh Patrick Mountain, Co. Mayo, in 1854. The prevailing form in Cumberland and Scotland is the var. *cassiope*, F. The tawny or orange bands are rarely so entire on the forewings as in *epiphron*, and are generally rather narrower, and that on the hind wing is broken up into three or four rings. The black dots are usually smaller and without white pupils. Previous to 1809, the species was unknown in Britain, but in June of that year it was taken on the mountains at Ambleside. Localities.—A

few specimens taken on June 23rd, 1841, near the edge of Styhead Tarn, between Borrowdale and Wastdale (R. Bowman Labrey, Ent. vol. i., p. 171). Derwentwater (W. C. Marshall, Ent., vol. iv., p. 201). Green Crag, in Borrowdale, very abundant (W. Greenip, Ent. Weekly Intelligencer, vol. ii., p. 117). Green Gable Mountain, at the head of Buttermere (Barrett's Lepidoptera, vol. i., p. 215). Helvellyn (H. A. Crewe, Ent. Weekly Intelligencer, vol. vi., p. 198). Keswick—Locally abundant, var. *cassiope* is the prevailing form (H. A. Beadle, Ent. Record, vol. vi., p. 277). Vale of Newlands (G. Dawson). Styhead Pass and Sprinkling Tarn (J. A. Malcolm). Honister Pass (M. Dixon, Ent. Record, vol. xiv., p. 49). Near Buttermere (F. H. Day).

**Pararge egeria**, L. (Speckled Wood). The type form, which is deep brown with bright fulvous markings, occurs in southern Europe, and our British form is the var. *egerides*, Staud., which is dark fuscous with pale yellow markings. In Cumberland it is apparently very rare, and has been recorded as such from Keswick (H. A. Beadle, Ento. Record, vi., p. 277). It has been recorded from Witherslack in Westmorland (J. B. Hodgkinson, Ento. Mo. Mag., iii., p. 37).

**Pararge megaera**, L. (Wall Butterfly). In the Carlisle district it is common in lanes in May and June, and again at the end of July and August, also common on the Solway Firth from Bowness to Allonby (F. H. Day). Common at Kingmoor, Todhills, Orton, Newby Cross, and Newbiggin Woods (G. Dawson). In the Brampton district scarce since 1881 (G. B. Routledge). Very scarce in Great Salkeld district (H. Britten). Keswick district, rare (H.A. Beadle, Ento Record, vol. vi., p. 277).

**Hipparchia (Satyrus) semele**, L. (Grayling). Kingmoor, Todhills, Orton, Newby Cross, Newbiggin Woods ; is most plentiful at Silloth and Allonby (G. Dawson). Abundant on the sandhills at Silloth, in July (F.H. Day). St. Bees Head and Seascale (J. Murray) ; also at St. Bees Head (J. Parkin). Occurs in fair abundance on the railway bank at Leegate Station (J. Parkin). One seen in a disused gravel-pit in Carlisle, in 1897 (F. H. Day). In the Brampton district, one specimen (male)

taken in 1879, near Middle Gelt Bridge (G. B. Routledge). Keswick district—found on Barrow Mountain (H. A. Beadle, Ent. Record, vol. vi., p. 277).

**Epinephele ianira**, L. (Meadow Brown). Common in lanes and meadows. Some curious bleached specimens occur in the Great Salkeld district (H. Britten).

**Epinephele tithonus**, L. (The Gatekeeper). Very Local. Rare at Keswick (Beadle, Ent. Record, vol. vi., 277). Abundant near St. Bees (G. Mawson); also taken at St. Bees by J. Murray in August, 1907.

**Enodia (Epinephele) hyperanthus**, L. (The Ringlet). Our Cumberland specimens of this species are of a much paler colour on the underside than those taken in the South of England, which are of a dark brown. Of specimens taken at Hayton Moss, were some which had on the under-side transverse lines on the outer half of all the wings, and the space between these lines suffused with whitish, and one of these butterflies has been figured in South's Butterflies of the British Isles. *E. hyperanthus* is locally abundant on the mosses in the county at Kingmoor, Todhills, Orton, Newby Cross, and Newbiggin Woods (G. Dawson). Orton, Silloth (F. H. Day). Hayton Moss and Cowran (G. B. Routledge). Wigton district (J. Parkin). Keswick district—H. A. Beadle has not taken it, but has seen some captured by the late W. Greenip in meadows about Keswick (Ent. Record, vol. vi., p. 277). Sparingly at Barron Wood, much more abundant at Ennim and Newton Moss (H. Britten).

ab. **caeca**, Fuchs. With white points only (no yellow circum-scriptions) on under side. Hayton Moss (G.B. Routledge). Orton Moss (J. A. Malcolm).

ab. **arete**, Müll. With the white centres surrounded by yellow rings. Orton Moss (J. A. Malcolm).

**Coenonympha typhon** Rott.; **davus** F. (Large Heath). This is an exceedingly variable species in the British Isles. Dr. F. J. Buckell, in the Ent. Record, vol. vii., p. 101, says that this species can be divided into three groups, as follows:—

1. British Southern form.—Dark ground colour, with large well-marked ocellated spots on the underside var. *philoxenus*, Esp.=*davus*, Haw.=*rothlisbii*, H.S.

2. British Middle form.—Intermediate in colour between *philoxenus* and *laidion*, intermediate also in its ocellation—*C. typhon*, Rott (the type), = *polydama*, Haw.
3. British Northern form. Upper-side pale tawny ocellated spots few or absent, the underside with greenish-grey base to hind wings, and with ocellated spots almost obsolete—var. *laidion*, Bork.

The Southern form is met chiefly on the Lancashire mosses, reaching across to the Southern part of Westmorland. The middle form occurs at Morpeth, Carlisle, and Penrith, and the Northern form at Rannoch and Aberdeen. Forms intermediate between Southern and Middle, and Middle and Northern occur at Carlisle. F. H. Day, in litt., writes :—“An examination of my series (all Cumberland specimens) leads me to classify them as follows—(1) The typical form which is the commonest form I have; (2) A form intermediate between the type and var. *laidion*; (3) A form intermediate between the type and var. *philoxenus*. These two intermediate forms contain examples which lean very closely to *laidion* and *philoxenus* respectively. I have two specimens in particular, which are quite as dark as *philoxenus*, but which have not the ocellation strong enough to be that form. The Bowness Moss specimens are mostly the form intermediate between the type and *philoxenus*. Todhills produce the type and the two intermediate in about equal numbers, and the Bolton Fell specimens are mostly typical with a few leaning to *laidion*.”

Orton and Newby Cross on a piece of common at the Dalston end of the woods (G. Dawson). Todhills, Bowness Moss, and Bolton Fell (F. H. Day). Wedholme Flow, Wigton (F. H. Day). Gelt Wood, Hayton Moss, and Tindale Fell (G. B. Routledge). Keswick, rare on Ullock Moss, and near Watendlath, on the Rosthwaite Road (H. A. Beadle, Ent. Record, vol. vi., p. 277). Kirkbampton Moss, common (M. Dixon). Abundant on a moss at Wan Fell (H. Britten).

***Coenonympha pamphilus*, L.** (Small Heath). Common throughout the county.

ab. *lyllus*, Esp. Dark marginal border to the fore and hind wings. Two specimens of this form were taken on Hayton Moss in 1889 (G. B. Routledge). Also near Carlisle (F. H. Day).

**Ruralis** (*Thecla*) *betulae*, L. (Brown Hairstreak). Very rare. One specimen at Barron Wood (J. B. Hodgkinson, Newman's British Butterflies, p. 113). Recorded as having been taken in Cumberland in C. G. Barrett's British Lepidoptera, vol. i., p. 44, and also in J. W. Tutt's British Butterflies, 1896, p. 205; and Tutt's British Lepidoptera, vol. ix., p. 316. It occurs in the neighbouring counties at Grange and Silverdale, in North Lancashire, and Witherslack, in Westmorland. "This appears to be its northern limit, unless the record of a single specimen at Barron Wood, Cumberland, is correct" (C. G. Barrett's Brit. Lepidoptera, vol. i., p. 44).

**Bithys** (*Thecla*) *quercus*, L. (Purple Hairstreak). Local. Carlisle district (J. B. Hodgkinson, Ent. Weekly Intelligencer, vol. vii., p. 102; also by T. Armstrong on page 29). Orton (J. A. Malcolm). Thurstonfield, Orton, Newby Cross, Dalston Hall, and Newbiggin Woods (G. Dawson). Orton and Armathwaite (G. Wilkinson, Tutt's British Lepidoptera, vol. ix., p. 269). Keswick—rare (H. A. Beadle, Ento. Record, vol. vi., p. 277). Barron Wood (F. H. Day and H. Britten).

**Callophrys** (*Thecla*) *rubi*, L. (Green Hairstreak). Local, but generally fairly common where it occurs. Carlisle district (J. B. Hodgkinson, Ento. Weekly Intelligencer, vii., p. 102). Plentiful in May at Orton (F. H. Day). Burgh—common, especially in clearings after a wood has been cut down (M. Dixon). Gelt Wood and Hayton Moss (G. B. Routledge). Abundant at Lazonby Fell and Barron Wood (H. Britten). Common at Ullock Moss, specimens occurring which were suffused on the upper surface with ochre-coloured scales (H. A. Beadle, Ento. Record, vi., p. 277).

**Rumicia** (*Chrysophanus*) *phlaeas*, L. (Small Copper). Abundant in the county throughout the late spring to autumn. At Keswick H. A. Beadle has taken a variety with a well-developed row of blue spots on the upper surface of the hind wings (Ento. Record, vi., p. 277).

ab. *schmidtii*, Gerh. (Ground colour, whitish instead of copper).

R. Leighton took a specimen of this variety near Newby in August, 1894.

**Plebeius (Lycaena) argus**, Haw ; **aegon**, Schiff. (Silver-studded Blue). Keswick district ; rather rare (H. A. Beadle, Ent. Record vi., p. 277). This butterfly is more common at Witherslack in Westmorland.

**Aricia (Polyommatus) astrarche**, Staud. ; **agæstis**, Hub. (Brown Argus). There are three forms of this species in Great Britain :—the type form *astrarche*, the intermediate form ab. *salmacis*, Stphs., (a form intermediate between ordinary *astrarche* and *artaxerxes*), and var. *artaxerxes* Fab., which has a white central spot in the forewings, and is only taken in Scotland. This form, and also *salmacis*, are not found anywhere outside the British Isles. This butterfly has been only recorded from Keswick, rather rare (H. A. Beadle, Ent. Record vi., p. 277). ab. *salmacis* form in Cumberland (C. G. Barrett's Lepidoptera of the British Isles, vol. i., p. 77). In the neighbouring counties it occurs at Witherslack and Arnside in Westmorland, and at Grange and Silverdale in North Lancashire, and has been recorded from Dumfries.

**Polyommatus icarus**, Rott. ; **alexis**, Hub. (Common Blue). Generally common throughout the county.

**Polyommatus corydon**, Scop. (Chalk Hill Blue). Cumberland (C. G. Barrett's Lepidoptera, vol. i., p. 89 ; R. South's Butterflies of the British Isles, p. 169). In the Entomologist, vol. xxi., p. 54, J. B. Hodgkinson states that " This butterfly used to occur at Grisedale, at the foot of Saddleback, in Cumberland. He also says " that he has seen some specimens taken there by the late Mr. Hope, of Penrith, the locality being far away from the chalk." This butterfly is taken not uncommonly at Grange, and it gets less common nearer Windermere.

**Celastrina (Cyaniris) argiolus**, L. (Holly Blue). Carlisle district—" One specimen taken in May at Wetheral " (T. Armstrong, Ent. Weekly Intelligencer, vol. vii., p. 29). J. B. Hodgkinson has a note in the Ent. Weekly Intelligencer, vol. vii., p. 103, of one specimen taken in Cumberland a few miles east of Carlisle—probably the same specimen that was taken at

Wetheral. Keswick district—taken near Keswick, not uncommon (G. Mawson). About hollics, near Lodore, and on the Borrowdale Road (H. A. Beadle, Ent. Record, vol. vi., p. 277). Workington district—uncertain and spasmodic (G. Wilkinson, Tutt's Brit. Lepidoptera, vol. ix., p. 477). It is taken in the neighbouring county of Westmorland, being fairly common at Kendal (Rev. A. M. Moss's authority).

**Cupido minima**, Staud.; **alsus**, Schiff. (Small Blue). Local, but not uncommon. Brampton district—Cowran Hills in May (T. Armstrong, Ent. Weekly Intelligencer, vol. vii., p. 29). Hayton Moss, Castle Carrock, &c. (G. B. Routledge). Gelt Wood (F. H. Day). Carlisle district—railway banks at Wreay and on the banks of the Eden at Warwick Hall (G. Dawson). Whitehaven district—Railway banks near St. Bees (G. Mawson and J. Murray). Fairly plentiful on the railway banks at Armathwaite (H. Britten).

**Hamearis (Nemeobius) lucina**, L. (Duke of Burgundy Fritillary). This is a very doubtful species, and it has not been met with in the county by any of the collectors of the present day. Hodgkinson, in Newman's British Butterflies, p. 104, says:—"That it is not rare in Cumberland"—and in the Ent. Weekly Intelligencer, vol. vii., p. 103, that it occurs at Barron Wood, its only locality in Cumberland. It is found in the neighbouring county of Westmorland, and also North Lancashire. Dumfries is the only locality in Scotland from which it has been reported.

**Nisoniades tages**, L. (Dingy Skipper). Carlisle district—Common on Kingmoor, Todhills, Orton, Newby Cross, and Newbiggin (G. Dawson). Durdar, Wreay (F. H. Day). Gelt, Cowran railway banks, and Hayton Moss (G. B. Routledge). Wigton district (J. Parkin). Silloth district (F. H. Day). Keswick—uncommon and local (H. A. Beadle, Ent. Record, vol. vi., p. 277). Lazonby Fell and Barron Wood (H. Britten).

**Augiades (Hesperia) sylvanus**, Esp. (Large Skipper). Common round Carlisle in grassy places near woods (F. H. Day). Thurstonfield, Orton, Newby Cross (G. Dawson). Orton (J. A. Malcolm). Keswick district—rather rare, occurs in the great wood (H. A. Beadle, Ent. Record, vol. vi., p. 277).

## DOUBTFUL SPECIES.

**Papilio machaon**, L. (Swallow Tail). Of this species, J. B. Hodgkinson records the capture of one specimen at Gilsland, about 15 miles east of Carlisle, and says : " whether it had been bred and escaped, or how it came there, I cannot tell " (Newman's British Butterflies, p. 152). Its headquarters in England are the counties of Norfolk and Cambridge.

**Issoria (Argynnis) lathonia**, L. (Queen of Spain Fritillary). J. B. Hodgkinson, in the Ent. Weekly Intelligencer, 1859, vol. vii., p. 103, records : " that he saw a pair of *lathonia* some 26 years ago in a clover field when he was catching *Plusia gamma*, in September ; he could easily have caught them, but did not attach much importance to them then. He had them under his cap, but was not anxious about securing them ; the Newcastle and Carlisle Railway sheds now stand upon the field." The southern and south-eastern coasts of England are the most productive quarters for this species. It has also occurred in Yorkshire, one specimen being obtained at Scarborough in 1868 (J. H. Rowntree) ; one at York, (E. Birchall, Newman's British Butterflies, p. 35.)

**Limenitis sibylla**, L. (White Admiral). J. B. Hodgkinson records : " that Armstrong, gardener at St. Anne's Hill, Carlisle, told him that he saw a specimen for several days in his garden in the summer of 1859. Mr. Armstrong is conversant with ordinary species, and has a small collection ; Hodgkinson could scarcely credit it, but he persisted in his opinion " (Ent. Weekly Intelligencer, vol. vii., p. 104). *L. sibylla* is confined to woods, and its chief locality is the New Forest, in Hampshire ; formerly occurred in South Lincolnshire, Northamptonshire, and Cambridgeshire.

**Erebia aethiops**, Staud. ; **blandina**, Fab. (Scotch Argus). This butterfly, which as a British species was discovered in the Isle of Arran in 1804, and only occurs in the North of England and Scotland. It is, however, of rare occurrence in Cumberland. J. B. Hodgkinson knew of only one specimen taken in Cumberland (Ento. Weekly Intelligencer, vii, p. 103) ; and H. A. Beadle says : " that it has been reported as having been taken at Keswick, but that he has not yet met with it " (Ento. Record, vi., p. 277). In the neighbouring counties it

has been found around the Lowther Hills in Dumfriesshire, is plentiful at Witherslack in Westmorland, and found in profusion at Arnside, also at Grange and Silverdale in North Lancashire.

**Adopaea (Hesperia) flava**, Brunn.; **linea**, F.Schiff.; **thaumas**, Staud. (Small Skipper). Recorded by T. Armstrong in the Ent. Weekly Intelligencer, vol. vii., p. 29, as having been taken in June, at Carlisle. J. B. Hodgkinson, in vol. vii., p. 102, says this record is an error. It is fairly common in several places in Yorkshire, and found at Silverdale in North Lancashire, which is probably its most northern limit in these islands.

The following have been recorded from the neighbouring counties, but so far have not been met with in Cumberland :—

**Edwardsia (Thecla) w-album**, Knoch. (White Letter Hair-streak).

Taken near Dumfries by W. Lennon (Ent. Weekly Intelligencer, vi., p. 202).

**Hesperia malvae**, L. (Grizzled Skipper). Witherslack in Westmorland (Arkle. Ent., xxi., p. 316). Newcastle (Wailles). Silverdale in North Lancashire (Melvill).

### SYNOPSIS OF CUMBERLAND BUTTERFLIES.

#### Generally common :—

P. brassicae  
P. rapae  
P. napi  
E. cardamines  
B. selene  
P. atalanta  
A. urticae  
E. ianira  
C. pamphilus  
R. phlaeas  
P. icarus  
N. tages

12 species.

#### Uncertain appearance :—

C. edusa  
P. cardui  
V. io  
E. antiopa  
4 species.

#### Rare :—

L. sinapis  
C. hyale  
A. adippe  
D. paphia  
P. c-album  
E. polychloros  
P. egeria

**Locally common :—**

G. rhamni  
 B. euphrosyne  
 A. aglaia  
 M. aurinia  
 M. epiphron  
 P. megaera  
 H. semele  
 E. tithonus  
 E. hyperanthus  
 C. typhon  
 B. quercus  
 C. rubi  
 C. minima  
 A. sylvanus

14 species.

**Rare—continued :**

R. betulae  
 P. aegon  
 A. astrarche  
 P. corydon  
 C. argiolus  
 H. lucina

13 species.

**Doubtful :—**

P. machaon  
 E. aethiops  
 I. lathonia  
 L. sibylla  
 A. flava

5 species.

# THE LAND AND FRESHWATER SHELLS OF CUMBERLAND.

By JAMES MURRAY.

(Read Feb. 8, 1908.)

The County of Cumberland has been fairly worked for its Land Shells, not generally, but in certain districts. Admitting 87 species of land snails as British, Cumberland can claim 63 of these, a very good proportion. It is not my intention to say anything about the physical features of the county, that can be found elsewhere. There is yet a lot of work to be done in working out the variation and distribution of our mollusca, and to facilitate this, the following summary has been compiled.

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Sometime during the middle of the last century, T. C. Heysham, the famous Carlisle Naturalist, wrote a work on the Land and Freshwater Shells. This was never published, and the M.SS. is unfortunately lost.

1. *Acicula lineata*, Drap. In damp moss. Rare.—Keswick, Buttermere.

Var. *alba*. Very Rare.—Keswick.

2. *Carychium minimum*, Müll. Very common among dead leaves, on damp logs, &c.—Carlisle, Keswick.

3. *Helix aspersa*, Müll. Rare inland, but only too common on the coast. I have only seen two specimens from Carlisle, which had probably been imported, while about Whitehaven it is by far the commonest snail.—Maryport, Seascale, Keswick, Buttermere.

. Var. *tenuis*.—Carlisle.

4. *Helix nemoralis*, Linn. Common about hedges round Carlisle, but rarer in Lakeland, where its place is taken by *H. hortensis*. It is common on the sandhills at Silloth, where most of the shells are of a single-banded form.—B.F., 00300.

Var. *rubella*. Common.—Silloth.

Var. *libulella*.—Carlisle.

Var. *roseolabiata*.—Carlisle, Keswick.

5. *Helix hortensis*, Müll. Common about Carlisle. I have some beautiful typical specimens from Barrock Fell. I have found it not uncommon in the western part of the county.—Carlisle, Brampton, Keswick, Whitehaven.

Var. *lutea*. Common.—Carlisle, Brampton, Keswick.

Var. *lutea-pallida*.—Carlisle.

Var. *coalita*.—Carlisle.

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- Var. *lilacina*.—Carlisle.
6. *Helicigona arbustorum*, Linn. Common enough among nettles, &c., about Carlisle, Brampton, and Keswick. This snail lives well in captivity.—Alston.
- Var. *fusca*. Not uncommon near Carlisle.
- Var. *flavescens*.—Carlisle, Keswick.
- Var. *marmorata*.—Carlisle.
- Var. *minima*.—Penrith.
- Var. *alpestris*.—Keswick.
- Var. *conoidea*.—Keswick.
7. *Hygromia rufescens*, Penn. Very common.—Carlisle, Keswick, Whitehaven.
- Var. *albocincta*.—Keswick.
- Var. *rubens*.—Keswick.
- Var. *minor*.—Carlisle.
8. *Hygromia hispida*, Linn. Common.—Carlisle, Keswick, Brampton, Maryport, Alston.
- Var. *subrufa*.—Keswick, Brampton.
- Var. *hispidosa*.—Carlisle, Keswick, Brampton.
9. *Hygromia granulata*, Ald. Plentiful, but local.—Carlisle, Brampton, Keswick.
10. *Hygromia fusca*, Mont. Common about Keswick, Alston, Caldbeck.
11. *Helicella barbara*, Linn. A couple were exhibited to the Conchological Society by Rev. H. Friend, in 1890, as new to Cumberland. It is also recorded from the Cumberland coast south of St. Bees.
12. *Helicella caperata*, Mont. Rare near Carlisle, but plentiful in the Lake Country and on the coast.—Aspatria, Penrith, Silloth, Whitehaven.
- Var. *ornata*.—Aspatria.
- Var. *fulva*.—Keswick.
13. *Helicella itala*, Linn. Dead specimens from Ravenglass.
14. *Helicella virgata*, Da C. Not common.—Silloth, Maryport, Ravenglass.
15. *Acanthinula aculeata*, Müll. One of the commonest species about Keswick, according to Capt. Farrer.—Carlisle, rare.
- Var. *albida*.—Keswick.

16. *Acanthinula lamellata*, Jeff. Far from common.—Carlisle and Keswick, Aspatria.
17. *Vallonia pulchella*, Müll. Well distributed, and not rare in moss, &c.—Penrith, Keswick, Whitehaven, Silloth, Carlisle.
18. *Vallonia costata*, Müll. Rare.—Brampton.
19. *Buliminus obscurus*, Müll. Local and nowhere common.—Alston, Penrith, Keswick, Aspatria, Carlisle, Brampton.
20. *Pupa anglica*, Fer. Among moss.—Keswick.
21. *Pupa cylindracea*, Da C. Common on walls.—Alston, Keswick, Carlisle, Aspatria, Penrith.  
Var. *albina*.—Keswick.
22. *Pupa muscorum*, Linn. At grass roots on the sandhills at Silloth and Ravenglass.
23. *Vertigo antivertigo*, Drap. On dead reeds.—Keswick, Calder Bridge.  
(*Vertigo moulinsiana*, Dup. Recorded from Keswick, but afterwards withdrawn).
24. *Vertigo pygmæa*, Drap. Seems most plentiful on the limestone.—Penrith, Keswick, Whitehaven, Aspatria.
25. *Vertigo substriata*, Jeff. Rare.—Keswick.
26. *Balea perversa*, Linn. Not common.—Carlisle, Penrith, Keswick, Whitehaven.
27. *Clausilia bidentata*, Strom. Common, and generally distributed.—Carlisle, Aspatria, Penrith, Keswick, Whitehaven.  
Var. *dubia*.—Brampton.  
Var. *tumidula*.—Penrith.
28. *Clausilia laminata*, Mont. Not common.—Carlisle, Penrith, Keswick, Wigton, Caldbeck.
29. *Opeas goodalli*, Müll. Recorded by Miss Donald as found in the cucumber beds in Botcherby gardens, Carlisle.
30. *Cochlicopa lubrica*, Müll. Very common.—Carlisle, Keswick, Whitehaven, Alston.  
Var. *hyalina*.—Alston, Keswick.  
Var. *lubricoides*.—Keswick.
31. *Azece tridens*, Pult. Given by Miss Donald as common near Carlisle. I have found it very rare, and Capt. Farrer found one specimen only at Keswick, Alston, Caldbeck, Buttermere,

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Var. *crystallina*. Rare.—Carlisle.

32. *Testacella haliotide*, Drap. Rare.—Keswick.
33. *Testacella maugei*, Fer. Rare.—Keswick.
34. *Vitrea pellucida*, Müll. Common.—Carlisle, Keswick, Alston.
35. *Vitrea cellaria*, Müll. Common.—Carlisle, Keswick, Alston, Whitehaven.

Var. *albida*. Rare.—Carlisle, Whitehaven.

36. *Vitrea glabra*, Brit. Auct. Recorded by Miss Donald from Wetheral. Keswick, Drigg, Allonby.
37. *Vitrea alliaria*, Müll. Common.—Carlisle, Keswick, Alston, Whitehaven.
38. *Vitrea nitidula*, Drap. Common.—Carlisle, Alston, Keswick, Whitehaven.
39. *Vitrea lucida*, Drap. Very rare.—Keswick, Penrith.
40. *Vitrea radiatula*, Ald. Scarce.—Carlisle, Brampton, Silloth, Keswick, Alston.

Var. *viridescens*-*alba*. Very rare.—Carlisle.

41. *Vitrea pura*, Ald. Not common near Carlisle. Common at Keswick.

Var. *margaritacea*. Associated with the type, but not common.—Carlisle, Keswick.

42. *Vitrea crystallina*, Müll. Common.—Carlisle, Keswick, Alston.
43. *Euconulus fulvus*, Müll. Common about Keswick, but much less so in the Carlisle district.—Alston.

Var. *alderi*.—Keswick.

44. *Zonitoides nitidus*, Müll. Capt. Farrer says this snail is common amongst the dead reeds, and under pieces of wood on the shores of the lakes.
45. *Zonitoides excavatus*, Bean. Local, and not common.—Carlisle, Brampton.

Var. *vitrea*.—Keswick.

46. *Limax maximus*, Linn. Not very plentiful.—Carlisle, Keswick.
47. *Limax flavus*, Linn. Not common.—Keswick.
48. *Limax arborum*, B. Ch. Very rare.
49. *Agriolimax agrestis*, Linn. Very common.—Carlisle, Keswick, Whitehaven.
50. *Agriolimax lævis*, Müll. Common.—Carlisle, Keswick.

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51. *Amalia gagates*, Drap. Rare.—Keswick, Buttermere.
52. *Amalia sowerbyi*, Fer. Not uncommon at Keswick.  
Var. *nigrescens*.—Keswick.
53. *Arion ater*, Linn. Very common.
54. *Arion subfuscus*, Drap. Common about Keswick.
55. *Arion intermedius*, Norm.
56. *Arion hortensis*, Fer. Common at Keswick, Carlisle, and Whitehaven.
57. *Arion circumscriptus*, Johnst. Common.
58. *Pyramidula rotundata*, Müll. One of the commonest snails in the county.—Carlisle, Whitehaven, Penrith, Keswick, Armathwaite, Alston.  
Var. *alba*.—Keswick, Carlisle, rare.  
Var. *turtoni*.—Keswick, Carlisle.  
Var. *rufula*.—Keswick.
59. *Pyramidula rupestris*, Drap. Local.—Brampton, Aspatria, Keswick. At the summit of Skiddaw, 3,054 feet (Farrer).
60. *Punctum pygmæum*, Drap. More local than rare.—Carlisle, Keswick.
61. *Sphyradium edentulum*, Drap. Common.—Carlisle, Aspatria, Keswick.
62. *Succinea putris*, Linn. Very common about Carlisle; less so at Keswick, Brampton.
63. *Succinea elegans*, Risso. Common about Keswick.

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## FRESHWATER SHELLS.

( Read Feb. 4, 1909. )

This list of Cumberland Freshwater Shells is a companion paper to that on the Land Shells of Cumberland, which I read before this Society last year. It enumerates 31 species of Freshwater Mollusca as inhabiting this county.

Considering the large area of the county, and the abundance of lakes, streams, and ponds, there is scope for considerably extending this list. There are many districts as yet untouched by the collector, only the neighbourhoods of Carlisle and Keswick having been anything like thoroughly investigated. The student will at once notice the absence from the list of such large and con-

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spicuous species as *Planorbis corneus*, *Limnæa stagnalis*, and *L. auricularia*. There is no reason why some of these should not eventually be proved to occur in Cumberland.

For a bibliography, the reader must refer to my former paper.

1. ***Bithynia tentaculata***, Linn. Common in rivers, ditches, and ponds in the Carlisle district.  
Var. ***decolata***.—Carlisle.
2. ***Valvata piscinalis***, Müll. Very common in streams and ponds, Carlisle district ; Derwentwater.
3. ***Valvata cristata***, Müll. Very local.—Keswick district and Caldbeck, where it is plentiful.
4. ***Ancylus fluviatilis***, Müll. Common on stones in streams. Occurs in all the rivers in the neighbourhood of Carlisle, also in the Keswick district and West Cumberland.  
Var. ***albida***.—Keswick.  
Var. ***gibbosa***.—Keswick.
5. ***Velletia lacustris***, Linn. Local and rare in the Carlisle district. On reeds in Bassenthwaite Lake.
6. ***Limnæa palustris***, Müll. Streams and ponds. Local, but common where it occurs in the Carlisle district. Silloth, Penrith.  
Var. ***tincta***.—Penrith.
7. ***Limnæa truncatula***, Müll. Very common in many localities in the Carlisle district, Keswick, Silloth.  
Var. ***minor***.—Brampton and Aspatria districts.
8. ***Limnæa glabra***, Müll. Local, but sometimes plentiful.—Carlisle and Keswick.
9. ***Limnæa pereger***, Müll. Our most abundant freshwater mollusc. Found in nearly every pond and stream.  
Var. ***ovata***.—Carlisle, Keswick.  
Var. ***lacustris***.—Derwentwater.  
Var. ***decolata***.—Carlisle.  
Var. ***acuminata***.—Carlisle.  
Var. ***candida***.—Penrith.  
Var. ***boissyi***.—Keswick.
10. ***Planorbis lineatus***, Walker. Not common.—Carlisle, Ennerdale, Keswick.
11. ***Planorbis fontanus***, Lightf. Very common in ponds in the Carlisle district.—Keswick.

12. *Planorbis nautilus*, Linn. Generally on dead leaves in ponds.  
—Carlisle, Maryport, Penrith.  
Var. *cristata*.—Pond near Penrith.
13. *Planorbis albus*, Müll. Fairly common in the Carlisle district  
in ponds and streams.—Keswick.
14. *Planorbis glaber*, Jeffr. Very rare.—Keswick.
15. *Planorbis spirorbis*, Müll. Locally common in several ponds  
and ditches near Carlisle, and near Keswick.
16. *Planorbis vortex*, Linn. Not uncommon near Keswick.—  
Maryport.
17. *Planorbis carinatus*, Müll. Rare.—Penrith district.
18. *Planorbis marginatus*, Drap. The commonest species of  
*Planorbis* in the Carlisle district. Common in the Eden  
and its tributaries.
19. *Planorbis contortus*, Linn. Not particularly common in the  
Carlisle district.—Penrith and Keswick districts.
20. *Aplexa hypnorum*, Linn. Ditches and ponds. Not uncom-  
mon near Carlisle, Keswick, Wigton.
21. *Physa fontinalis*, Linn. Plentiful near Carlisle. Not common  
near Keswick.
22. *Unio margaritifer*, Linn. Penrith and Keswick districts.  
The River Irt, in West Cumberland, is a famous locality for  
this shell, and this locality was worked for its pearls at a very  
early date.  
Var. *arcuata*.—In the Derwent.
23. *Anodonta cygnæa*, Linn. Rare near Carlisle.—Penrith district.  
Var. *zollensis*.—Borrowdale.
24. *Anodonta anatina*, Linn. Carlisle. Very rare.
25. *Sphærium corneum*, Linn. Common and fine in the Carlisle  
district, Penrith, Keswick.  
Var. *flavescens*.—Carlisle.
26. *Sphærium lacustre*, Müll. Common near Carlisle, Penrith,  
Keswick.
27. *Pisidium amnicum*, Müll. Common near Carlisle, Cockermouth.
28. *Pisidium fontinale*, Drap. Not common.—Carlisle, Keswick.
29. *Pisidium pusillum*, Gmel. Fairly common.—Carlisle, Keswick
30. *Pisidium nitidum*, Jenyns. Ditches. Rare.—Carlisle,
31. *Pisidium milium*, Held. Ponds. Rare.—Keswick.

# THE COLEOPTERA OF CUMBERLAND.

## PART I.

BY FRANK H. DAY, F.E.S.

(Read Dec. 5th, 1907.)

## PREFACE.

Although a considerable amount of work has been done of late years towards obtaining reliable knowledge of the coleopterous fauna of Cumberland, the present catalogue must only be looked upon as a tentative one.

Very extensive areas have only been casually collected over, and even more extensive areas (perhaps one-half of the entire county) have not as yet known the foot of the investigating coleopterist; while even in those districts almost under daily observation, species new to the county are constantly coming to light.

While being thus conscious of the incompleteness of this catalogue I feel that the time is ripe for bringing forward all that is known on the subject, as a basis of future work, and in the hope of stimulating fresh energies to help in the local study of these interesting insects.

Colcopterists have always been few in Cumberland. It is probable that the four who at present constitute the collecting strength of the county, are a larger body numerically than has ever existed contemporaneously before. When some few years ago Messrs. G. B. Routledge, and James Murray and myself, commenced work at the Order, the recorded knowledge of Cumberland beetles did not extend beyond 500 species. By the end of the year 1900, this list had grown to 1,117 species. Then with Mr. H. Britten taking up the study and lending valuable assistance, the list continued to grow, and at the time of writing is approximately 1,630 species. In my prefatory notes to the list of Cumberland beetles in the Victoria History of the county, I expressed the opinion that the list would ultimately run to 1,700 species. That was seven years ago. It will therefore be

seen that my anticipation is being slowly but steadily realized. Owing to the nature of the medium through which this catalogue is being published, it will be some years before it can be completed. In some respects, perhaps, this is unfortunate. It will have the advantage, however, of permitting newly discovered natives of the county to be incorporated in the work—in the body of the text, as far as possible, or in an appendix at the end.

The catalogue, when finished, will in consequence be more complete than if based alone upon the notes at present in hand and printed at once entirely, and it is quite likely that the anticipated total of 1,700 species will be reached or just about one-half of the British list.

Cumberland is in every way an admirable county for insect life. There is abundance of woodland and many plantations of fir and larch. Here and there are large tracts of undrained peat mosses, practically in a virgin state, where life of all kinds runs riot. Secluded country lanes, riverside waste land, as well as the land under cultivation, all support their quota of beetles. An extensive coast-line, with alternating sand dune and salt marsh, and for the most part a sandy beach is a prolific hunting ground.

Then the most striking of the county's physical features—the mountain systems of the Pennines and the lakes—provide an endless amount of excellent collecting. Probably no other English county contains so much wild, uncultivated land as Cumberland, ground which from its nature must be favourable to the multiplication of insect life. From lack of opportunity much promising country has not been explored, and owing to difficulty of access much other country remains unknown.

Reference to Cumberland coleoptera in published works are not numerous, but may be found in the following :—

“ British Entomology,” by Curtis, 1823-40 (abbreviated Curt. Brit. Ent.).

“ Illustrations of British Entomology,” by J. F. Stephens, 1827-35 (abbreviated Ste. Illus.).

“ Manual of British Colcoptera,” by J. F. Stephens, 1839. (abbreviated Ste. Man.).

The records in these three works are for the most part on the authority of the late T. C. Heysham, with some few by Weaver, Dale, and Dr. Leach.

"Geodephaga Brittanica," by J. F. Dawson, 1854.  
(abbreviated Dawson).

"Coleoptera of Northumberland and Durham," by Hardy and Bold. (abbreviated Bold).

The Cumberland localities in the last-named work are all in the east of the county, near the Northumberland boundaries. In some cases where the locality mentioned is simply "Irthing," or "Banks of the Irthing," it is of course not quite certain whether Cumberland can claim the record, as the river for part of its course forms the boundary between our county and Northumberland, and in these cases there is nothing to show which side of the river is meant. However, it is reasonable to include them as with most of Bold's Irthing records, the precise locality of "Lanercost" is added, which of course is in Cumberland and some miles from the border line, and we know that he spent a good deal of time on the river near that picturesque point.

"Coleoptera of the British Islands," by Canon Fowler,  
Vols I.—V., 1887-91. (abbreviated Fowler).

Most of the records in this work are taken from one or other of the foregoing books.

"List of Cumberland coleoptera," by F. H. Day, published in the Victoria History of Cumberland, 1901.

The only resident coleopterist in the past who attempted any systematic work at the subject, was T. C. Heysham, who, after collecting and studying insects of all Orders for close on half-a-century, established the foundation upon which all subsequent work must be based. He died in 1857.

Heysham did a great deal more work at the coleoptera than he has left any record of; in fact the same may be said of all his natural history studies. All we know of his captures of coleoptera are culled from Curtis's "British Entomology," and Stephens' "Illustrations" and "Manual." With both authors he was in close correspondence. His records in these publications extend to about 300 species, but as he continued his labours for 20 years or more after the foregoing works appeared, he must have added considerably to his initial list. In the early forties he was

exchanging letters and specimens with John Walton, who frequently congratulated him upon the value and interest of his finds. The two men met for the first time in the British Museum, in December, 1840, when Heysham had in his possession about 150 species of weevils, which had been "picked up when searching for plants." These most probably had been taken in Cumberland, and very many would be new to his records in "Curtis" and "Stephens," which only included some 55 species of the Rhyncophora. Further, it is remarkable that the majority of Heysham's recorded coleoptera are more or less rare species. Few of the commonest species are mentioned by him, although he must have known them as it is impossible to get rarities without collecting and naming very many common things.

Heysham's collecting expeditions took him into many parts of the county. He frequently visited the lake mountains, and was familiar with *Carabus glabratus* and other alpine beetles. Skiddaw was a favourite mountain with him, where he constantly searched for *Leistus montanus*, recorded thence by Curtis and Dale. Up to March, 1841, however, it eluded him when he at last was gratified in finding it.

In the immediate neighbourhood of Carlisle he collected diligently. Botcherby, Rickerby, Blackwell, Dalston, and other places are frequently mentioned in his records. Orton woods and "moss" gave him many good things, while Cardew Mire he worked assiduously for the aquatic species, among which he took several not since met with in the county.

One of his best captures was *Notiophilus rufipes*, which he took "once down Wadling," and was the first British capture of the species. It is now fairly well known in the southern counties of England, but curiously has not again occurred in Cumberland.

From his published records, Heysham appears to have neglected the *Staphylinidæ* to a great extent. However, his records of *Pæderus littoralis* and *riparius*, and *Deleaster dichrous*, show that he at any rate appreciated the more distinct and prettier species of the family. He also took *Bledius tricornis*, these four species almost exhausting his recorded work upon the family.

With the *Longicorns* he was markedly successful. Barron Wood was his favourite haunt for these fine insects, and here he met with *Strangalia quadrifasciaria*, *Clytus arcuatus*, and *Oberea oculata*. In the same locality he took some good weevils. *Rhynchites cupreus*, to day one of the most characteristic weevils of Barron Wood, he was familiar with, distributing it freely among his correspondents. On Burgh Marsh, where he spent much time, he took *Lixus paraplecticus*, a fine record for the north.

Much more might be written of Heysham's finds among the coleoptera of Cumberland, but enough has been said to show the excellent pioneer work he did at the subject. Many of the insects he took remain unique as local records, and owing to the changed conditions of the localities, most of such are likely to remain so. The ornithologist, the botanist, and the lepidopterist, have much to remember him for, but the coleopterist has even more, for until quite recently he stood alone as the only resident student of these insects.

Some years before Heysham's death, T. J. Bold was hard at work upon the coleoptera of Northumberland and Durham, at times passing over the boundary line of the river Irthing into Cumberland, and collecting on the banks of that stream as far west as Lanercost. He also visited Talkin Tarn. It was in the month of June, 1848, that Bold discovered *Bembidium stomoides* on a sandy bank of the Irthing, near Lanercost Abbey, and added an interesting species to the British list to which it was duly introduced in 1854 by Dawson in his "*Geodephaga Britannica*." The genus *Bembidium* was a favourite one with Bold. *B. schuppei* was another of his discoveries in the same locality. Both species still occur where he found them, and have since been captured on the banks of other streams in the county. Another ground beetle, *Dyschirius angustatus*, he also added to the British list from the same fruitful locality. Among the *Staphylinidæ* he added *Lathrobium angusticolle* and *Bledius erralicus*, bringing his list of additions to the British fauna from this one Cumberland locality up to five species, and for this reason Lanercost, and the river which flows under the shadow of its ancient abbey, and in close contiguity to the old Roman wall, is just as interesting to the local coleopterist as it is to the antiquarian.

To this brief reference to these old collectors, I may add a list of the Geodephaga (the section dealt with in the present instalment), not taken in the county since their time, viz. :—

<i>Notiophilus rufipes</i>	<i>Harpalus ignarus (honestus)</i>
<i>Leistus montanus.</i>	<i>Pterostichus anthracinus.</i>
<i>Elaphrus lapponicus.</i>	<i>Anchomenus 4-punctatus.</i>
<i>Dyschirius angustatus.</i>	<i>Tachypus pallipes</i>
<i>Badister sodalis.</i>	<i>Trechus longicornis.</i>
<i>Chlœnius nigricornis.</i>	<i>Trechus rubens.</i>
<i>Oodes helopioides.</i>	<i>Dromius sigma.</i>

As already mentioned, the present day collectors number four. Mr. G. B. Routledge's work has for the most part been in the east of the county, under the shadow of the Pennines, from which radiate such fine collecting grounds as the Irthing and Gelt Valleys. On Castle Carrock and Cumrew Fells, Mr. Routledge has found many interesting species, and Hayton Moss and the immediate neighbourhood of his residence, Tarn Lodge, have yielded a long list of records.

Mr. H. Britten's residence in south-east Cumberland found him when he added the coleoptera to his numerous natural history studies, in a district entirely *terra incog.* as regards its beetle fauna, and a perusal of his records shows the value and interest of his observations. The Eden Valley, from Langwathby to Armathwaite, the red sandstone hills between the river and the L. & N.W. Railway, and Cross Fell, the highest point of the Pennines, are the areas in which he has done most of his collecting.

Mr. Jas. Murray's temporary residence in, and frequent visits to West Cumberland, have enabled him to note the salient features of a somewhat meagre fauna, doubtless rendered so by the mining operations of the district. At Orton, Wreay, and elsewhere in the close vicinity of Carlisle, he has collected for a number of years, and assisted to a considerable extent my own work in the same area.

My own collecting in addition has been in various parts of the county. Keswick district, Newton Regny Moss, on the coast, along the Eden estuary, &c., frequently in company with one or other of my co-workers.

Many species of coleoptera are peculiar to a special habitat, others occurring more generally. To show at a glance the distribution of the species dealt with, it may be convenient to roughly divide the county into three areas :—

1. The area of low-lying flat ground or plain.
2. The sea coast and Eden estuary.
3. The mountains.

The first of these areas will be found to be most frequently quoted, from the fact of its being most accessible to resident collectors, and including a greater diversity of country, wood, moor, moss, meadow land, stream side, &c. The area covers the greater portion of the centre of the county, in fact, all ground other than coast or mountain.

The second area consists of the strip of coast-line from the mouth of the Esk to Duddon sands, including the extensive salt-marshes of the Solway. Collecting in this area has been largely confined to the parts impinging on the Solway Firth. From south of St. Bees there are very few records.

Number 3 area includes that part of the county covered by the mountain systems of the lakes and the Pennines, with, in addition, the low hills, Wan Fell, Lazonby Fell, &c., forming a ridge between the rivers Eden and Petteril. Although these hills only attain an elevation of some 800 feet, their coleopterous fauna has a distinctly alpine character.

In conclusion, I must express my obligations to all friends who have helped in any way the preparation of this catalogue, without which many valuable facts would have been omitted. Messrs. Routledge, Murray, and Britten, have allowed me the fullest use of their notes and observations, and given me every possible assistance. To them my special thanks are due, and with their names must be associated that of Mr. E. A. Newbery, of London, whose help in the identification and verification of critical species has been invaluable.

## CICINDELIDÆ.

### CICINDELA

**campestris.** L. Abundant in spring and early summer. Frequent on dry heaths, sand dunes, and gravelly hillsides.

1. Orton, Newby Cross, Warwick Moor, Gelt (Day) ; Skirwith (Britten).

2. Bowness-on-Solway, Beckfoot. (Day).
3. Falcon Crag, near Keswick, (Day); Duddon Valley (Murray); Wan fell, Lazonby fell (Britten); Hynam (Routledge).

## CARABIDÆ.

### CYCHRUS

**rostratus**, L. Under stones on road sides, in river beds and on the shore, sometimes in flood refuse.

1. Great Salkeld (Britten); Orton, Grinsdale, Carleton, Durdar, Gelt (Day).
2. Maryport (Swainson).

### CARABUS

**catenulatus**, Scop. The most abundant of the genus in Cumberland. Under stones on mountains, moors &c., in rotting timber and putrid fungi, in gardens, sometimes at "sugar."

1. Carlisle district, Orton, &c. (Day).
2. Silloth (Day).
3. Cumrew fell, Castle Carrock fell (Routledge); Wan fell, Lazonby fell (Britten); Cross fell, Skiddaw, Scaw fell, &c. (Day); Eskdale (Thornley); Mountains of Cumberland (Curt. Brit. Ent.)

**nemoralis**, Müll. Frequent in gardens and on roadways.

1. Great Salkeld (Britten); Carlisle, Carleton, Durdar, &c. (Day); Egremont (Murray).
2. Whitehaven (Murray).
3. Wan fell, Lazonby fell (Britten).

**glabratus**, Pk. Found only in the mountain area usually at considerable elevations, rarely as low as 400 feet. In wet weather the species may sometimes be met with in numbers running about among the short mountain grass. I have seen it devouring large black slugs when the rain has been pouring down, from which I infer that it is the search of such food which brings it out in wet weather.

3. Cumrew fell (Routledge, Murray, &c.); Honister Crag (Day); Scaw fell (Fowler, Britten, Day); Eskdale

(Thornley); Near Styhead (Blackburn); taken by Dale, Curtis, and Weaver, in the mountains of Cumberland (Steph. Illus., vol. i., p. 53).

**violaceus**, L. Under stones, on roads, &c. Common only in No. 3 area.

1. Carlisle (Day); Great Salkeld (Britten); Hayton, Tarn Lodge (Routledge).
3. Cumrew fell (Routledge); Cross fell (Britten); Scaw fell (Day). In the last locality a var. occurs rarely in which the elytra are brown and the violet colour of the margins absent.

**nitens**, L. Under stones, rare.

1. Near Carlisle, May 26th, T. C. Heysham (Ste. Illus.); (Curt. Brit. Ent.)
3. Cumrew fell, near the summit (Routledge, Day); Wan fell (Britten).

**granulatus**, L. Scarce. Under stones, in rotting wood, &c.

1. Orton, Durdar (Day).
2. Silloth (Day); Whitehaven (Murray).
3. Rosthwaite in Borrowdale (Britten).

**monilis**, F. Of this species there does not appear to be a Cumberland specimen extant. Recorded in the Victoria History on the authority of Mr. Britten, who, however, now thinks he may have been mistaken, as the record was based upon an observation made before he collected coleoptera, and he may have confused the species with *nemoralis*. *Monilis* occurs in Northumberland, so is quite likely to turn up in Cumberland.

**arvensis**, Herbst. A very variable insect in colour, ranging from coppery to green and black. Not very common, and as yet only noticed in the mountain area.

3. Cumrew fell (Donisthorpe, Day); Scaw fell, Styhead, Wan fell (Britten, Day); Honister crag (Day); Eskdale (Thornley); found in the mountains of Cumberland by Mr. Dale (Ste. Illus., Dawson).

#### NOTIOPHILUS

**biguttatus**, F. Common on paths, in flood refuse, moss, &c.

1. Tarn Lodge, &c. (Routledge); Carlisle District, &c. (Day); Great Salkeld, Skirwith, &c. (Britten).

2. Whitehaven (Murray) ; Silloth (Day).

3. Cumrew fell, Skiddaw, &c. (Day).

**substriatus**, Wat. Much scarcer. Usually on the edges of streams and ponds.

1. Tarn Lodge (Routledge) ; Great Salkeld (Britten) ; banks of River Petteril at Carleton (Day) ; Cumberland (Bold).

2. Burgh Marsh (Day).

3. Eskdale, near one of the tarns (Thornley).

**4-punctatus**, Dj. Rare.

1. A solitary specimen taken near the canal reservoir, T. C. Heysham (Ste. Illus) ; near Carlisle (Ste. Man.) ; Great Salkeld (Britten).

**aquaticus**, L. Fairly common ; under stones, &c.

1. Tarn Lodge (Routledge) ; Carlisle, Orton, and Petteril valley (Day) ; Great Salkeld, Barron wood (Britten).

3. Ennerdale (Murray) ; Cumrew fell (Day) ; Cross fell, Wan fell (Britten).

**palustris**, Duft. Common in moss, &c.

1. Hayton Moss (Routledge) ; Great Salkeld, Barron wood (Britten) ; Carlisle, Durdar, Orton, &c. (Day).

3. Wan fell (Britten) ; Cumrew fell, abundant (Day).

**rufipes**, Curt. Very rare.

1. Carlisle, T. C. Heysham, who added it to the British list (Curt. Brit. Ent.) ; Tarn Wadling, T. C. H. (Ste. Illus.) ; near Carlisle (Ste. Illus.) ; near Carlisle (Dawson).

These records all apply to the same specimen, which apparently is the only one taken in the county.

### LEISTUS

**montanus**, Steph. Rare and not taken recently.

3. Skiddaw (Ste. Illus. ; Dawson ; Fowler) ; mountains of Cumberland (Ste. Man.) ; also taken on Skiddaw under slates by T. C. Heysham.

**fulvibarbis**, Dj. Common in woods among dead leaves, &c.

1. Tarn Lodge, Gelt (Routledge) ; Great Salkeld (Britten) ; Orton, Durdar, Wetheral, Newbiggin woods, &c. (Day).

3. Ashness wood, near Keswick (Day).

**rufescens**, F. Common in and near woods, but also occurring in alpine districts.

1. Tarn Lodge, Gelt (Routledge) ; Great Salkeld (Britten) ; Petteril valley, Orton, Kirkbampton (Day) .
3. Cumrew fell (Routledge) ; Keswick (Day).

**NEBRIA**

**brevicollis**, F. Common under stones.

1. Tarn Lodge (Routledge) ; Great Salkeld (Britten) ; Carlisle and district (Day).
2. Whitehaven (Murray).
3. Wan fell, Cross fell (Britten) ; Watendlath (Day).

**gyllenhali**, Sch. Locally abundant, usually on the margins of streams.

1. Gelt, Kingwater (Routledge) ; Great Salkeld (Britten) ; banks of the Irthing and Petteril (Day) ; Cumberland (Dawson).
2. Rockcliffe Marsh (Day).
3. Cross fell (Britten) ; Cumrew fell, Tindale (Day) ; summit of Skiddaw (Ste. Illus.) ; mountains of Cumberland (Ste. Man.).

**BLETHISA**

\***multipunctata**, L.

1. One specimen at the junction of the Irthing and Gelt, May 7th, 1901 (Routledge) ; sometimes abundant near Carlisle, T.C. H. (Ste. Illus.) ; near Carlisle (Ste. Illus. ; Dawson ; Curt. Brit. Ent. and Fowler).

**ELAPHRUS**

**riparius**, L. Common on muddy margins of streams and ponds.

1. Edmond Castle, Easby (Routledge) ; Great Salkeld, Barron wood, Edenhall (Britten) ; Carlisle, Wreay, Kirkbampton, Newton Regny moss, &c. (Day) ; Tarn Wadling, T. C. H. (Ste. Illus.) ; Carlisle (Ste. Man. ; Dawson).

**cupreus**, Duft. Of similar habits to the last and equally common.

1. Tarn Lodge, Gelt (Routledge) ; Great Salkeld, Barron wood, Edenhall (Britten) ; Petteril valley, Kirkbampton, Durdar, &c. (Day) ; Carlisle (Ste. Man. and Illus.)
2. Burgh Marsh (Murray).

**lapponicus**, Gyll. Rare, there is but one record.

3. Skiddaw, J. T. Harris (Fowler, vol. i., p. 18).

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\* Abundant at Monkhill in May, 1909. F.H.D.

**LORICERA**

**pilicornis**, F. Common under stones, &c.

1. Tarn Lodge, &c. (Routledge); Great Salkeld, Barron wood, Edenhall, Newton Regny moss, Skirwith (Britten); Petteril Valley, Cummersdale, Durdar, &c. (Day).
2. Whitehaven (Murray); Silloth, Seascale (Day).
3. Wan fell, Cross fell (Britten).

**CLIVINA**

**fossor**, L. Common under stones.

1. Tarn Lodge, &c. (Routledge); Great Salkeld, Barron wood (Britten); Durdar, Cummersdale, Wreay, Newby Cross, &c. (Day); Carlisle (Ste. Illus.)
3. Wan fell (Britten); Watendlath (Day).

**collaris**, Hbst. Stream sides, not uncommon.

1. River Irthing (Routledge); Rivers Caldew and Gelt (Day); River Eden (Britten); River Irthing (Bold); near Carlisle (Ste. Illus.)
2. Burgh Marsh (Donisthorpe).

**DYSCHIRIUS**

**impunctipennis**, Daws. Mudbanks near the sea, not uncommon.

2. Silloth (Routledge, Day); Skinburness (Day).

**politus**, Dj. Sandy places near water, both inland and maritime.

1. Barron wood (Britten); Rule Holme on the Irthing (Routledge).
2. Burgh Marsh (Donisthorpe); Anthorn on the Wampool, Rockcliffe Marsh (Day).

**nitidus**, Dj. Mudbanks near the sea, scarce.

2. Burgh Marsh (Donisthorpe, Day).

**angustatus**, Ahr. Two examples taken by Bold on a damp, sandy bank by the River Irthing a little above Lanercost Abbey, Cumberland, in June (Dawson, p.31); banks of the Irthing (Fowler).

**salinus**, Schaum. Mudbanks near the sea, common.

2. Silloth (Routledge); Burgh Marsh, Skinburness, Anthorn (Day).

**æneus**, Dj. Scarce.

2. Burgh Marsh (Day).

**globosus**, Hbst. Common near streams and ponds.

1. Petteril Valley (Day) ; Great Salkeld (Britten) ; edges of heaths, Carlisle, T. C. H. (Curt. Brit. Ent.)
2. Burgh Marsh, Silloth, Skinburness (Day).
3. Wan fell (Britten).

### MISCODERA

**arctica**, Pk. Scarce, an alpine species.

3. Wan fell (Britten) ; Cross fell (Britten, Day).

### BROSCUS

**cephalotes**, L. Common on the coast under shore-refuse, &c.

2. Burgh Marsh, Silloth, Allonby, Maryport (Day) ; St. Bees (Murray).

### BADISTER

**bipustulatus**, F. Under stones, &c.

1. Hayton, Tarn Lodge, &c. (Routledge) ; Langwathby, Skirwith (Britten) ; Carlisle district (Day) ; Carlisle (Ste. Illus.)
2. Whitehaven (Murray) ; Allonby (Day).
3. Near Ullswater (Day).

**sodalis**, Duft. Not taken for many years.

1. "Near Carlisle in March, 1828, apparently extremely local, having yet only met with it on a woody bank in company with *B. bipustulatus*."—Heysham (Ste. Illus) ; Carlisle (Ste. Man.) ; Carlisle (Dawson) ; Carlisle (Fowler).

### CHLÆNIUS

**nigricornis**, F.

1. On the banks of one of the Cumberland tarns in June, 1848 (T. J. Bold, Zoologist, 1849, p. 2373) ; rare, shore of Talkin Tarn (Bold's Cat.)

### OODES

**helopioides**, F.

1. Near Carlisle, T. C. H. (Ste. Illus. and Man.)

**BRADYCELLUS**

**placidus**, Gyll. Locally common in sphagnum and hedge cuttings.

1. Orton (Routledge, Britten, Day) ; Easton, Kirkbampton (Day).

**cognatus**, Gyll. Common in moss on moors, and at high elevations.

1. Kirkbampton (Day) ; Great Salkeld (Britten).
3. Cumrew fell (Routledge, &c.) ; Wan fell (Britten, &c.)

**verbasci**, Duft. Rare.

1. One specimen at root of a tree at Woodbank, near Carlisle, 20th February, 1897 (Day).

**harpalinus**, Dej. Common in moss.

1. Hayton Moss, Edmond Castle (Routledge) ; Durdar, Kingmoor, Kirkbampton, Cummersdale, Great Salkeld (Day).
2. Burgh Marsh (Routledge).
3. Castle Carrock fell (Routledge) ; Wan fell (Britten).

**collaris**, Payk. Not uncommon in high districts in dry moss.

1. Great Salkeld (Britten).
3. Castle Carrock fell (Routledge) ; Wan fell (Britten) ; Cumrew fell, Skiddaw, High Pike, Ashness near Keswick (Day).

**similis**, Dej. Very common in moss on heaths.

1. Tarn Lodge, Hayton Moss (Routledge) ; Great Salkeld, Barron wood (Britten) ; on all the heaths near Carlisle (Day).
3. Penrith Beacon (Britten) ; Wan fell, High Pike, Cumrew fell (Day).

**HARPALUS**

**rufibarbis**, F. Rather scarce.

1. Petteril valley near Carlisle (Murray) ; Great Salkeld, a nice series under a rail on the banks of the Eden (Britten, Day) ; Barron wood (Britten).
3. Wan fell (Britten).

**ruficornis**, F. Common under stones and running on paths.

1. Tarn Lodge, &c. (Routledge) ; Carlisle district, &c. (Day) ; Great Salkeld, &c. (Britten).
3. Cross fell, Wan fell (Britten).

**æneus**, F. Almost as common as the last, variable in colour.

1. Hayton, Gelt, &c. (Routledge); Great Salkeld, Barron wood (Britten); Durdar, Orton, Armathwaite, &c. (Day).
2. Silloth (Day).
3. Wan fell (Day); Cross fell (Britten).

**rubripes**, Duft. Apparently rare in the county, but perhaps overlooked as *æneus*.

1. Hayton, Tarn Lodge (Routledge).
2. Silloth, 1 specimen (Day).

**latus**, L. Common under stones, &c.

1. Tarn Lodge, &c. (Routledge); Carlisle district (Day); Great Salkeld (Britten).
3. Castle Carrock fell (Routledge); Wan fell (Britten); Skiddaw, Borrowdale, Honister Crag (Day).

**var. erythrocephalus**, F.

1. Petteril Valley, Orton (Day).
3. Wan fell (Britten).

**rufimanus**, Marsh (*tardus*, Brit. Cat.) Locally common on roads.

1. Tarn Lodge (Routledge); Great Salkeld, Skirwith (Britten); Gelt (Day).
3. Wan fell (Britten).

**honestus**, Duft. Cumberland occasionally (Ste. Illus. and Man.)

### DICHIOTRICHUS

**pubescens**, Payk. A common shore beetle, occurring under rejectamenta.

2. Silloth, Skinburness (Day, &c.)

### ANISODACTYLUS

**binotatus**, F. Under stones, local and not very common.

1. Tarn Lodge (Routledge); Great Salkeld (Britten); Orton (Day, Murray).

**var. spurcaticornis**, Dej. One specimen in a stone-heap at Prior Rigg, near Carlisle (Day).

### STOMIS

**pumicatus**, Pz. Under stones and in flood refuse, fairly abundant.

1. Tarn Lodge, Ring-gate, Edmond Castle (Routledge); Great Salkeld (Britten); Petteril valley (Murray); Orton (Day).
3. Wan fell (Britten).

**PTEROSTICHUS**

**cupreus**, L. Under stones and on roads, local.

1. Found in several places near Carlisle, rather common (Ste. Illus.) ; Orton, Blackwell (Day).
2. Silloth (Day).

**var. affinis**, Sturm. 1. Orton, rare (Day).

**versicolor**, Sturm. Very common on roads and pathways in spring and early summer.

1. Tarn Lodge, &c. (Routledge) ; Great Salkeld, Barron wood, Edenhall, &c. (Britten) ; Carlisle district (Day, Murray).
3. Wan fell (Britten) ; Cross fell (Day).

**lepidus**, F. Very local and scarce.

3. Under stones among the heath on Wan fell (Britten, Routledge, Day).

**madidus**, F. The most abundant of the larger ground beetles.

1. Tarn Lodge, &c. (Routledge) ; Great Salkeld, &c. (Britten) ; Carlisle district, &c. (Day) ; Cumberland, common (Ste. Illus. and Man.)
2. Silloth, Burgh Marsh (Day).
3. Cross fell, Wan fell (Britten) ; Cumrew fell, Skiddaw, Scaw fell, High Pike, &c. (Day).

**æthiops**, Panz. Under stones in high districts, not scarce.

3. Castle Carrock and Cumrew fells (Routledge) ; Cross fell (Britten) ; Scaw fell and surrounding mountains (Day).

**vitreus**, Dej. Also an alpine species, common.

3. Castle Carrock and Cumrew fells (Routledge) ; Skiddaw, Scaw fell, Styhead, Tindale (Day).

**niger**, Schall. Under stones, &c., fairly common.

1. Tarn Lodge, &c. (Routledge) ; Great Salkeld, Barron wood, (Britten) ; Carlisle district, Gelt, &c. (Day).
2. Whitehaven (Murray).
3. Wan fell, Cross fell (Britten) ; Watendlath (Day).

**vulgaris**, L. Under stones, &c., common.

1. Tarn Lodge, &c. (Routledge) ; Great Salkeld, Skirwith, Edenhall, Barron wood, (Britten) ; Carlisle district (Day).
2. Whitehaven (Murray).
3. Wan fell, Cross fell (Britten).

**anthracinus**, Ill. Not taken in recent years.

Cumberland (Stc. Illus. and Man.)

**nigrita**, F. Under stones, in flood refuse, &c., common.

1. Tarn Lodge, &c. (Routledge); Great Salkeld, Newton Regny Moss, &c. (Britten); Carlisle district (Day).
2. Silloth (Day).
3. Cross fell (Britten); Watendlath (Day).

**minor**, Gyll. In sphagnum, under stones, on the margins of ponds, &c.

1. Orton, Kirkbampton, Edenhall (Day).

**strenuus**, Panz. In moss, under stones, &c., very common.

1. Banks of the Irthing and Gelt (Routledge) Great Salkeld (Britten); Carlisle district, &c. (Day).
2. Burgh Marsh (Routledge); Silloth (Day).
3. Castle Carrock fell (Routledge); Cross fell, Wan fell (Britten); Watendlath, High Pike, &c. (Day).

**diligens**, Sturm. Common in moss on heaths, &c.

1. Hayton Moss (Routledge); Orton, Durdar, Gelt (Day); Great Salkeld, Newton Regny Moss, &c. (Britten).
3. Cumrew fell (Day); Wan fell, Cross fell (Britten).

**vernalis**, Panz. On the margins of streams and ponds, common.

1. Tarn Lodge, Gelt (Routledge); Great Salkeld (Britten); Cummersdale, Wetheral, Carleton (Day).
2. Burgh Marsh (Day).

**striola**, F. Under stones and rotten wood, fairly common.

1. Gelt (Routledge); Cummersdale, Carleton, Aspatria, Penrith (Day).
3. Lazonby fell (Britten); Ashness, near Keswick (Day).

## AMARA

**fulva**, De G. Under stones, banks of streams, &c., fairly common.

1. Tarn Lodge, Gelt (Routledge); Great Salkeld (Britten); Petteril Valley (Day).

**apricaria**, Payk. Under stones, on paths and roads, common.

1. Tarn Lodge (Routledge); Great Salkeld (Britten); Carlisle district (Day).
2. Silloth, Burgh Marsh (Day).
3. Wan fell (Britten); Cumrew fell (Routledge); Skiddaw (Day).

**consularis**, Duft. Under stones, scarce.

1. Great Salkeld (Britten).
2. Silloth (Day).
3. Castle Carrock fell (Routledge); Cumrew fell (Day).

**aulica**, Panz. Under stones and by sweeping. I have taken a number on the flowers of black knapweed (*Centaurea nigra*).

1. Edmond Castle (Routledge); Great Salkeld (Britten); Carlisle district (Day).

**patricia**, Duft. Rare.

3. Wan fell, 1 specimen, 9th September, 1901 (Britten).

**bifrons**, Gyll. Under stones, locally common.

1. Hayton (Routledge); Great Salkeld (Britten).
2. Allonby (Day).

**ovata**, F. On roads in spring and early summer, rather scarce.

1. Hayton (Routledge); Barron wood, Great Salkeld (Britten); Petteril Valley, Gelt, Upperby (Day).

**similata**, Gyll. Banks of streams, &c., fairly common.

1. Hayton, Tarn Lodge (Routledge); Great Salkeld, Barron wood (Britten); banks of the Eden and Petteril (Day).

**acuminata**, Payk. On roads, scarce.

1. Hayton, Talkin (Routledge); Great Salkeld (Britten); Durdar (Day).

**tibialis**, Payk. On roads, &c., common in places but local.

1. Tarn Lodge, Ring-gate, &c. (Routledge); Great Salkeld (Britten); Southwaite (Day).
2. Silloth (Day).
3. Wan fell (Britten).

**lunicollis**, Schiod. Under stones, &c., common.

1. Tarn Lodge, &c. (Routledge); Great Salkeld (Britten); Durdar, Orton, &c. (Day).
2. Burgh Marsh (Day).
3. Wan fell (Britten); Borrowdale, Cumrew fell, Tindale (Day).

**familiaris**, Duft. On roads and paths, common.

1. Hayton Moss, Tarn Lodge, Gelt (Routledge); Great Salkeld (Britten); Orton (Day).
2. Whitehaven (Murray); Allonby (Day).
3. Wan fell (Britten).

**lucida**, Duft. Rare.

2. Seascale, 1 specimen, April, 1905 (J. C. V. Smith).

**trivialis**, Gyll. On roads, &c., common.

1. Tarn Lodge, &c. (Routledge); Great Salkeld (Britten); Carlisle district (Day).
2. Burgh Marsh, Silloth (Day).
3. Wan fell (Britten).

**communis**, Panz. On roads, in moss, &c., common.

1. Gelt, Tarn Lodge (Routledge); Great Salkeld (Britten); Carlisle district (Day).
2. Whitehaven (Murray).
3. Skiddaw (Day).

**plebeia**, Gyll. On roads, &c., common.

1. Great Salkeld (Britten); Carlisle district (Day).
2. Burgh Marsh (Day).
3. Cumrew fell (Routledge).

### CALATHUS

**cisteloides**, Panz. Under stones, common.

1. Tarn Lodge, &c. (Routledge); Great Salkeld (Britten); Durdar, Cummersdale, &c. (Day).
2. Allonby (Day).
3. Wan fell (Britten); Styhead (Day).

**fuscus**, F. Under stones, local and scarce.

1. Near Carlisle, T. C. H. (Ste. Illus.)
2. Allonby (Day).
3. Wan fell (Britten, Day).

**flavipes**, Fourc. Under stones and at roots of grass, common.

1. Near Carlisle, T. C. H. (Ste. Illus. and Man.); Great Salkeld (Britten).
2. Silloth, Allonby (Day).
3. Wan fell (Britten).

**mollis**, Marsh. Common on the coast at the roots of marram grass, rare inland.

1. Great Salkeld (Britten); Orton, 1 specimen (Day).
2. Silloth, Allonby (Day).

**melanocephalus**, L. Under stones, at roots of grass, in moss, &c., very common.

1. Tarn Lodge, &c. (Routledge); Great Salkeld, Skirwith, &c. (Britten); Carlisle district (Day); Cleator Moor, Egremont (Murray).
2. Silloth, Burgh Marsh, &c. (Day); Whitehaven (Murray).
3. Pennines, Skiddaw, Scaw fell, &c. (Day); Cross fell, Wan fell (Britten).

**var. nubigena**, Hal. Locally common.

1. Great Salkeld (Britten).
3. Castle Carrock fell (Routledge); Cross fell, Wan fell (Britten); Cumrew fell, Skiddaw (Day).

**micropterus**, Duft. A mountain species, locally abundant.

3. Castle Carrock and Cumrew fells (Routledge, Day); Rotherhope, Styhead (Britten).

### AMPHIGYNUS

**piceus**, Marsh. Under stones, at tree roots, &c., rather scarce.

1. Great Salkeld (Britten); Carleton, Cummersdale, Wetheral, Armathwaite (Day).
3. Castle Carrock (Routledge); Wan fell (Britten).

### TAPHRIA

**nivalis**, Panz. On roads and paths, &c., scarce.

1. Tarn Lodge (Routledge); Durdar (Day); Great Salkeld (Britten); banks of the Irthing (Bold).
3. Castle Carrock fell (Routledge); Wan fell (Britten); Styhead pass (Day).

### PRISTONYCHUS

**terricola**, Herbst. Usually about houses, sometimes in fields, &c.

1. Hayton, Gelt, &c. (Routledge); Carlisle (Day); Great Salkeld (Britten).
3. Wan fell (Britten).

### ANCHOMENUS

**angusticollis**, F. In and near woods among dead leaves, under stones, &c., common.

1. Edmond Castle (Routledge); Great Salkeld, Edenhall (Britten); Carlisle, T. C. H. (Ste. Illus.); Durdar, Orton, Wetheral, &c. (Day).

**dorsalis**, Müll. Under stones, at tree roots, &c., common.

1. Tarn Lodge, &c. (Routledge); Cleator Moor (Murray); Great Salkeld, &c. (Britten); Carlisle district (Day).
2. Whitehaven (Murray); Burgh Marsh (Day).
3. Wan fell (Britten).

**albipes**, F. By the sides of streams and ponds, very common.

1. Gelt, Wreay (Routledge); Great Salkeld, Skirwith, &c. (Britten); Cleator Moor (Murray); Carlisle district (Day); Cumberland (Ste. Illus. and Man.).
2. Allonby (Day).
3. Hynam Bridge (Routledge); Seathwaite (Day).

**marginatus**, L. Stream and pond sides, locally common.

1. Great Salkeld (Britten); Sebergham, Thurstonfield (Day).

**parumpunctatus**, F. In moss, flood refuse, &c., common. Dark blue specimens occasionally occur.

1. Tarn Lodge, &c. (Routledge); Great Salkeld, Gamblesby, &c. (Britten); Carlisle district, &c. (Day).
2. Whitehaven (Murray).
3. Wan fell (Britten).

**viduus**, Panz. Under refuse near water, local.

1. Thurstonfield Lough (Day).

**var. moestus**, Duft.

1. Great Salkeld (Britten, Day).

**micans**, Nic. Flood refuse, &c., local.

1. Great Salkeld (Britten, Day).

**fuliginosus**, Panz. In moss, at roots of grass, &c., common.

1. Great Salkeld, Edenhall, Newton Regny Moss (Britten); Cummersdale, Orton, Wreay, &c. (Day).
3. Castle Carrock fell (Routledge).

**gracilis**, Gyll. In moss, scarcer than the last.

1. Tarn Lodge, &c. (Routledge); Great Salkeld (Britten); Petteril and Caldew valleys (Day).
3. Cross fell (Britten).

**piceus**, L. Edges of ponds and streams, locally common.

1. Tarn Lodge (Routledge); Great Salkeld (Britten); Petteril valley, Thurstonfield Lough, Newton Regny Moss (Day).

**quadripunctatus**, De. G. Cumberland, 1 specimen taken by Mr. Weaver, and in Stephen's collection (Ste. Illus.)

**OLISTHOPUS**

**rotundatus**, Payk. Under stones, not uncommon in the mountain districts, scarce in the plains.

1. Carlisle (Ste. Illus. and Man.) ; Durdar (Day).
3. Cross fell, Wan fell, Styhead (Britten) ; Castle Carrock fell (Routledge) ; Cumrew fell (Day).

**BEMBIDIUM.**

**rufescens**, Guer. In flood refuse by the sides of streams, common.

1. On the banks of the Eden near Corby Castle and Rickerby ; on the Caldew near Dalston Hall, T. C. H. (Ste. Illus.) ; Great Salkeld (Britten) ; Wetheral, Carleton, Gelt, Cummersdale (Day).

**quinquestriatum**, Gyll. Rare.

1. Tarn Lodge (Routledge) ; Great Salkeld, Barron wood (Britten).

**obtusum**, Sturm. In moss and flood refuse, moderately common.

1. Cardew Mire, Botcherby, T. C. H. (Ste. Illus.) ; Great Salkeld, Barron wood (Britten) ; Petteril valley, Orton, Wetheral (Day).

**guttula**, F. In flood refuse, at roots of grass, &c., very common.

1. Gelt, Edmond Castle (Routledge) ; banks of Eden near Botcherby (Ste. Illus.) ; Great Salkeld, &c. (Britten) ; Carlisle district (Day).
2. Burgh Marsh, Anthorn, Silloth (Day).
3. Wan fell, Cross fell (Britten) ; Skiddaw, &c. (Day).

**mannerheimi**, Sahl. In flood refuse, &c., common.

1. Great Salkeld, Barron wood (Britten) ; Carlisle district (Day).
2. Burgh Marsh, Silloth (Day).
3. Castle Carrock fell (Routledge).

**biguttatum**, Gyll. Edges of ponds, in flood refuse, &c., common.

1. Cardew Mire, near Dalston, T. C. H. (Ste. Illus.) ; Great Salkeld (Britten) ; Orton, Petteril valley (Day).
2. Rockcliffe Marsh, T. C. H. (Ste. Illus.) ; Burgh Marsh (Day).

**riparium**, Ol. Confused with the last species by many collectors. and probably often overlooked.

2. Rockcliffe Marsh (Day).

**æneum**, Germ. On mudbanks, common on the coast, rare inland.

1. One specimen on the Irthing near Easby (Day); Gelt (Routledge).
2. Burgh Marsh T. C. H. (Ste. Illus.); Skinburness, Silloth, Burgh Marsh (Day, &c.)

**doris**, Panz. Edges of ponds, locally abundant.

1. Orton, Kirkbampton (Day); Edenhall (Britten).
2. Silloth (Day).

**minimum**, F. Mudbanks, &c., common on the coast, one specimen has occurred inland.

2. Drumburgh Marsh T. C. H. (Ste. Illus.); Burgh Marsh, Skinburness, Silloth, Anthorn (Day).
3. Wan fell (Britten).

**normannum**, Dej. On mudbanks, locally common.

2. Skinburness (Day, Britten); Anthorn (Day).

**schüppeli**, Dej. Banks of streams, locally common.

1. On the Irthing (Bold, Routledge, Day, Murray); Great Salkeld, Barron wood (Britten); Grinsdale (Murray); Wetheral (Day).

**lampros**, Herbst. On paths, in flood refuse, &c., common.

1. Tarn Lodge, &c. (Routledge); Great Salkeld (Britten); Carlisle district (Day).
2. Whitehaven (Murray); Silloth, Burgh Marsh, Anthorn, &c. (Day).
3. Wan fell (Britten).

**var. velox**, Er. 2. Burgh Marsh, Anthorn (Day.)

**nigricorne**, Gyll. In heathy elevated districts, running on paths, &c., locally common.

3. Wan fell (Britten, Day); Castle Carrock fell, on tracks in the heather made by game (Routledge).

**tibiale**, Duft. Shingly banks of streams, common.

1. Gelt (Routledge); banks of Eden and Esk T. C. H. (Ste. Illus.); banks of the Irthing (Bold); Great Salkeld, &c. (Britten); on all the streams near Carlisle (Day).
3. Cross fell, Barrow Cascade near Keswick (Day); Ullswater (Britten).

**atrocæruleum**, Steph. Shingly banks of streams, common.

1. Long Island and Cummersdale T. C. H. (Ste. Illus.) ; Rivers Gelt, Irthing and King (Routledge) ; Great Salkeld (Britten) ; Petteril valley, Caldew valley, Barron wood, &c. (Day).
3. Ullswater (Britten) ; Ennerdale, in flood refuse (Murray).

**decorum**, Panz. Shingly banks of streams, common.

1. Banks of Esk near Mossland T. C. H. (Ste. Illus.) ; rivers Gelt, King and Irthing (Routledge) ; Great Salkeld (Britten) ; Wetheral, Penton, Caldew valley, Petteril valley (Day).

**affine**, Steph. On the sandy banks of streams, scarce.

1. A few specimens by the Gelt and Irthing (Day).

**monticola**, Sturm. On the sandy banks of streams, under sand-stone slabs, &c., fairly common.

1. Rivers Gelt and Irthing (Routledge) ; Great Salkeld (Britten) ; Petteril valley, by the Eden at Wetheral (Day).
2. One specimen near Anthorn at the mouth of the Wampool (Day).

**stomoides**, Dej. Occurs under similar circumstances to the last, but less freely.

1. Banks of the Irthing (Bold, Routledge, Day) ; banks of the Gelt (Routledge, Day, Murray). "The first British specimens were taken by Bold on the Irthing on a sandy bank of the river between Lanercost Abbey and Naworth Castle, in June, 1848, but it is apparently very scarce" (Dawson) ; Cumberland (Fowler).

**\*quadriguttatum**, F. The only Cumberland *Bembidium* which has not occurred recently.

1. Carlisle T. C. H. (Ste. Illus. and Man.)

**lunatum**, Duft. Mudbanks on the coast, not uncommon, also inland by stream sides.

1. A few specimens by the Irthing (Routledge, Day) ; Irthing (Bold) ; abundant on the banks of the Irthing (Dawson) ; Carlisle (Ste. Man.)
2. Sandsfield, 2 specimens T. C. H. (Ste. Illus) ; Rockcliffe and Burgh Marsh (Day).

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\* Occurred commonly at Cumwhinton brick ponds in May, 1909. F.H.D.

**testaceum**, Duft. Rare.

1. One specimen on the banks of the Irthing, near Easby, May 6th, 1905 (Day).

**concinnum**, Steph. A maritime species, sometimes abundant on mudbanks by the sides of "creeks."

2. Drumburgh Marsh T. C. H. (Ste. Illus.); Burgh Marsh (Routledge and others); Anthorn, Skinburness (Day).

**femoratum**, Sturm. Stream sides among the shingle and gravel, local.

1. Irthing, in great profusion (Bold); Cardew Mire, Botcherby, &c. T. C. H. (Ste. Illus.); Gelt (Routledge); Great Salkeld (G. Wilkinson); Barron wood (Britten); on the Irthing near Easby, and on the Petteril near Carleton (Day).
3. Castle Carrock fell, 1 specimen (Routledge).

**bruxellense**, Wesm. Stream sides, &c., local and rather scarce.

1. River Irthing (Routledge); Gelt 2 specimens, a nice series on the Black Lync near Mallsburn, also at Kirkbampton on a wet muddy place on a "moss" (Day).

**saxatile**, Gyll. Locally abundant by the edges of streams and ponds both inland and on the coast.

1. Banks of Eden near Beaumont T. C. H. (Ste. Illus); Rivers Gelt, Irthing and King (Routledge);
2. Allonby, Bowness-on-Solway (Day).
3. Hynam Bridge near Castle Carrock (Routledge).

**andreæ**, F. (*anglicanum*, Sharp) Banks of streams.

1. "In great profusion on the sandy flats of the Irthing, near Lanercost, amongst the stones, and generally at some distance from the river." (T. J. Bold, E.M.M., vol. vi., p. 213); Lanercost, Cumberland (Fowler); Gelt (Day).

**littorale**, Ol. Very common.

1. Rivers Irthing, Gelt and King (Routledge); Great Salkeld, &c. (Britten); banks of Esk, near Jamestown T. C. H. (Ste. Illus.); Carlisle district, &c. (Day).
2. St. Bees, Whitehaven (Murray); Allonby, Burgh Marsh, Silloth (Day).
3. Wan fell (Britten); Skiddaw, Borrowdale, &c. (Day).

**pallidipenne**, Ill. Wholly maritime, not uncommon at times under rejectamenta on the shore.

2. Silloth (Routledge, Day).

**bipunctatum**, L. On the sandy margins of streams &c., local.

1. Common on the banks of the Esk, T. C. H. (Ste. Illus) ; banks of the Irthing (Routledge) ; by the Eden in Barron wood (Britten) ; Thurstonsfield (Day).
2. Coast of Cumberland (Ste. Illus) ; Rockcliffe and Burgh Marshes (Day).

**punctulatum**, Drap. Very common among the shingle and gravel on most of our streams.

1. Banks of Eden and Caldew, T. C. H. (Ste. Illus) ; banks of the Irthing (Bold, Routledge and others) ; abundant on the Petteril and Caldew near Carlisle (Day) ; by the Eden at Great Salkeld and Barron wood (Britten) ; Carlisle (Ste. Man.).
2. Coast of Cumberland, T. C. H. (Ste. Illus.) ; Silloth (Routledge).

**prasinum**, Duft. Occurs similarly to the last but much more local, common in places.

1. Banks of the Irthing (Bold, Day) ; Carlisle (Ste. Illus. and Man., Dawson, Fowler) ; Barron wood (Routledge) ; Great Salkeld (Britten) ; on the Caldew and Petteril (Day).

**varium**, Ol. Very local but common in muddy hollows near the coast.

2. Skinburness Marsh (Britten, Day).

**paludosum**, Panz. Sandy banks of streams, locally common.

1. Cardew Mire, T. C. H. (Ste. Illus.) ; Carlisle (Ste. Man., Dawson) ; banks of the Derwent (Fowler) ; Gelt (Murray, Day) ; abundant by the Eden in Barron wood in June (Britten, Routledge, Day).

## TACHYPUS

**pallipes**, Duft. Not taken for many years.

1. " Banks of the Irthing, at no great distance from the fine old abbey of Lanercost ; this species I have never found more than a few yards from the water, it prefers dry sandy places which are sparingly covered with grass." (Bold, Zoologist, vol. iii., p. 1093) ; Irthing (Fowler).

**flavipes**, L. Sandy banks of streams, local.

1. Cardew Mire, Mossband, T. C. H. (Ste. Illus.) ; Carlisle (Ste. Man.) ; River Irthing (Bold) ; River Irthing between Castlesteads and Lanercost (Day) ; common at the junction of the Gelt and Irthing, May, 1901 (Routledge).
2. Rockcliffe, T. C. H. (Ste. Illus.) ; near Whitrigg at the mouth of the Wampool and on Rockcliffe Marsh (Day).

### TRECHUS

**discus**, F. Banks of streams, scarce.

1. Great Salkeld (Britten).

**micros**, Herbst. Banks of streams, scarce.

1. Carlisle (Ste. Man., Dawson, Fowler) ; Great Salkeld (Britten) ; on the Petteril near Carleton (Day).

**longicornis**, Sturm. Not taken recently.

1. " Three specimens taken out of rejectamenta on the Irthing, near Burtholme, in June. This locality is a little lower down the river than Lanercost, and just where it makes a sharp turn westward " (Bold, E.M.M., vol. vi., p. 213) ; banks of Irthing (Fowler).

**rubens**, F. Not taken recently.

1. Near Carlisle, T. C. H. (Ste. Man.) ; banks of the Irthing (Bold, Fowler).

**minutus**, F. Under stones, in moss, flood refuse &c., common.

1. Tarn Lodge, Gelt (Routledge) ; Great Salkeld &c. (Britten) ; Carlisle district (Day).
2. Silloth, Burgh Marsh (Day).
3. Castle Carrock fell (Routledge) ; Rotherhope (Britten).

**obtusius**, Er. Under stones &c., common.

1. Great Salkeld (Britten) ; Petteril valley (Day).
3. Castle Carrock fell (Routledge) ; Cumrew fell, Styhead (Day) ; Rotherhope (Britten).

**secalis**, Payk. Edges of ponds, local.

1. Orton (Day).
3. Wan fell (Britten).

**PATROBUS**

**excavatus**, Payk. Under stones &c., fairly common.

1. Tarn Lodge &c. (Routledge) ; Great Salkeld (Britten) ; Durdar, Orton, Gilsland (Day).
3. Cumrew fell (Routledge).

**assimilis**, Chaud. Under stones &c., moderately common in high districts.

3. Cross fell (Britten) ; Castle Carrock fell (Routledge) ; Cumrew fell (Day).

**POGONUS**

**chalcus**, Marsh. A common shore and salt-marsh insect.

2. Silloth (Routledge, Murray and others) ; Skinburness Marsh (Britten, Day).

**CYMINDIS**

**vaporariorum**, L. Under stones in mountain districts, not very common.

3. Castle Carrock fell (Routledge) ; Cumrew fell (Day) ; Wan fell (Britten, Day).

**LEBIA**

**chlorocephala**, Hoff. At roots of grass, rather scarce.

1. In the Petteril valley near Woodbank (Day, Murray) ; Langwathby, Great Salkeld (Britten).

**crux-minor**, L. Rare.

1. Orton near Carlisle, one specimen, April 15th, 1899, in a meadow (vide E.M.M., vol. xxxv., p. 145) (Day).

**DEMETRIAS**

**atricapillus**, L. 1. One specimen taken in Carlisle in 1907 by R. C. C. Potter.

**DROMIUS**

**linearis**, Ol. At roots of grass, common.

1. Hayton Moss (Routledge) ; Great Salkeld, Edenhall, Langwathby (Britten) ; Carlisle district (Day).
2. Silloth (Day).
3. Watendlath (Day).

**agilis**, F. Under bark, scarce.

1. Tarn Lodge, Gelt (Routledge).

**meridionalis**, Dej. Under bark, not very common.

1. Tarn Lodge (Routledge) ; Great Salkeld, Penrith (Britten).

**quadrinotatus**, L. Under bark, common.

1. Tarn Lodge &c. (Routledge) ; Great Salkeld, Barron wood, Edenhall (Britten) ; Carlisle district (Day).

**quadrinotatus**, Panz. Under bark, common.

1. Tarn Lodge (Routledge) ; Great Salkeld, Barron wood, Edenhall (Britten) ; Carlisle district (Day).

**melanocephalus**, Dej. At roots of grass, common.

1. Tarn Lodge (Routledge) ; Great Salkeld, Langwathby (Britten) ; Carlisle district (Day).
2. Silloth (Day).

**nigriventris**, Thoms. At roots of grass, very local.

1. Great Salkeld, Langwathby (Britten, Day).

**sigma**, Rossi. Not taken for many years.

1. Carlisle, T. C. Heysham (Curtis, Ste. Illus. and Man., Dawson, Fowler).

### METABLETUS

**foveola**, Gyll. At roots of grass and in sandy places, local but not uncommon.

1. Great Salkeld (Britten, Day) ; Grinsdale (Murray),
2. Silloth, among the sandhills (Day).

